Short-Scar Face Lift

Operative Strategies and Techniques

Patrick L. Tonnard • Alexis M. Verpaele

Thieme

راهنمای نصب آخرین نسخه آپتودیت آفلاین

۱. برای نصب اپلیکشین درگوشی آیفون، برنامه App Store و درگوشی اندروید Play Store را اجرا کرده سپس عبارت Mehrsys medical library را جستجو کنید و برنامه را نصب کنید.

۲. بعد از نصب و اجرای اپلیکیشن در صفحه اول برنامه **برای دریافت** Username و Password به **به تلگرام پشتیبانی و فروش که در زیر تصویر اشاره شده است پیغام دهید.**

۳. در مرحله بعد حساب کاربری خود را بسازید.

۴. بعد از ورود به برنامه در قسمت یا منوی Download روی آیکون سه نقطه آبی رنگ که رو به روی UpToDate قرار دارد کلیک کنید و گزینه دانلود Download را انتخاب کنید با این عمل می توانید دانلود را به آسانی از طریق اینترنت انجام دهید.

قابلیتهای برنامه

- دسترسی به آخرین نسخه آپتودیت آفلاین با قابلیت بروز رسانی
- امکان جستجو بسیار سریع مطالب بدون نیاز به اینترنت
- امکان مشاهده **abstract** رفرنسهای داخل مقالات آپتودیت
- قابل نصب بر روی گوشی و کامپیوتر
- دسترسی به دیگر منابع پزشکی و دارویی به صورت رایگان
- امکان انتخاب متون، کپی و ارسال آن به برنامه های دیگر
- هایلایت کردن متون در برنامه به رنگهای مختلف
- ذخیره کردن مقالات و عکسهای آپتودیت
- تولید شده توسط شرکت معتبر نرم افزاری و مورد تایید نظام صنفی رایانه ای کشور و شورای عالی انفورماتیک

Operative videos on MediaCenter.Thieme.com will help you incorporate procedure into practice!

Connect with us on social media

Short-Scar Face Lift

Operative Strategies and Techniques

Short-Scar Face Lift

Operative Strategies and Techniques

EDITED BY

Patrick L. Tonnard, MD

Assistant Clinical Professor, Department of Plastic Surgery, Gent University Hospital; Director, Coupure Centrum Voor Plastische Chirurgie, Gent, Belgium

Alexis M. Verpaele, MD

Assistant Clinical Professor, Department of Plastic Surgery, Gent University Hospital; Director, Coupure Centrum Voor Plastische Chirurgie, Gent, Belgium

ILLUSTRATIONS BY

Cameron Slayden, MS

Director, Editorial Services: Mary Jo Casey
International Production Director: Andreas Schabert
International Marketing Director: Fiona Henderson
International Sales Director: Louisa Turrell
Director of Sales, North America: Mike Roseman
Senior Vice President and Chief Operating Officer: Sarah Vanderbilt
President: Brian D. Scanlan

Illustrations by Cameron Slayden, MS, Cosmocyte, Inc.

Library of Congress Cataloging-in-Publication Data
is available from the publisher upon request.

Important note: Medicine is an ever-changing science undergoing continual development. Research and clinical experience are continually expanding our knowledge, in particular our knowledge of proper treatment and drug therapy. Insofar as this book mentions any dosage or application, readers may rest assured that the authors, editors, and publishers have made every effort to ensure that such references are in accordance with **the state of knowledge at the time of production of the book.**

Nevertheless, this does not involve, imply, or express any guarantee or responsibility on the part of the publishers in respect to any dosage instructions and forms of applications stated in the book. **Every user is requested to examine carefully** the manufacturers' leaflets accompanying each drug and to check, if necessary in consultation with a physician or specialist, whether the dosage schedules mentioned therein or the contraindications stated by the manufacturers differ from the statements made in the present book. Such examination is particularly important with drugs that are either rarely used or have been newly released on the market. Every dosage schedule or every form of application used is entirely at the user's own risk and responsibility. The authors and publishers request every user to report to the publishers any discrepancies or inaccuracies noticed. If errors in this work are found after publication, errata will be posted at www.thieme.com on the product description page.

Some of the product names, patents, and registered designs referred to in this book are in fact registered trademarks or proprietary names even though specific reference to this fact is not always made in the text. Therefore, the appearance of a name without designation as proprietary is not to be construed as a representation by the publisher that it is in the public domain.

Thieme Publishers New York
333 Seventh Avenue, New York, NY 10001 USA
+1 800 782 3488, customerservice@thieme.com

Thieme Publishers Stuttgart
Rüdigerstrasse 14, 70469 Stuttgart, Germany
+49 [0]711 8931 421, customerservice@thieme.de

Thieme Publishers Delhi
A-12, Second Floor, Sector-2, Noida-201301
Uttar Pradesh, India
+91 120 45 566 00, customerservice@thieme.in

Thieme Publishers Rio de Janeiro, Thieme Publicações Ltda.
Edifício Rodolpho de Paoli, 25º andar
Av. Nilo Peçanha, 50 – Sala 2508
Rio de Janeiro 20020-906, Brasil
+55 21 3172 2297

Printed in Italy 5 4 3 2 1

eISBN 978-1-62623-837-4

To

the children of Myanmar in need of our time and our skills
for liberating them from the curse of cleft lip and palate

Patrick L. Tonnard and Alexis M. Verpaele

Contributors

Daniel C. Baker, MD
Professor of Surgery, Department of Plastic Surgery, IRRS New York University, New York, New York; Traveling Professor, International Society of Aesthetic Plastic Surgery

Terrence W. Bruner, MD, MBA
Resident, Division of Plastic Surgery, Baylor College of Medicine, Houston, Texas

Alain Fogli, MD
National Secretary for France of International Society of Aesthetic Plastic Surgery, Department of Plastic and Aesthetic Surgery, Clinique Château Berger, Marseille, France

Joseph P. Hunstad, MD
Assistant Consulting Professor, Department of Surgery, Section of Plastic Surgery, Duke Medical Center, Durham; Section Head of Plastic Surgery, Department of Surgery, Carolinas Medical Center, University Hospital, Charlotte, North Carolina

Mark Laurence Jewell, MD
Assistant Clinical Professor, Department of Plastic Surgery, Oregon Health Science University, Portland, Oregon

Daniel Labbé, MD
Private Practice, Private Hospital St. Martin; Plastic Surgeon, Department of Plastic Surgery, Caen University Hospital, Caen, France

Foad Nahai, MD
Plastic Surgeon, Paces Plastic Surgery, Atlanta, Georgia

Julien Nicolas, MD
Department of Maxillofacial and Plastic Surgery, Anatomy Laboratory, Caen University Hospital, Caen, France

Thomas L. Roberts III, MD
Adjunct Professor of Plastic Surgery, Department of Surgery, Medical University of South Carolina, Spartanburg, South Carolina

Thomas L. Roberts IV, DMD, MSD
Senior Resident, Department of Orthodontics, Virginia Commonwealth University School of Dentistry, Richmond, Virginia

Patrick L. Tonnard, MD
Assistant Clinical Professor, Department of Plastic Surgery, Gent University Hospital; Director, Coupure Centrum Voor Plastische Chirurgie, Gent, Belgium

Alexis M. Verpaele, MD
Assistant Clinical Professor, Department of Plastic Surgery, Gent University Hospital; Director, Coupure Centrum Voor Plastische Chirurgie, Gent, Belgium

Foreword

It is my great privilege to write the foreword for Drs. Patrick Tonnard and Alexis Verpaele's new book, *Short-Scar Face Lift: Operative Strategies and Techniques, Volume II*. This work serves as a companion text to their first volume on the MACS-lift, published in 2004. In contemplating what to write, the question I first asked was why a second volume? The answer obviously lies in their desire to report personal progress as well as a response to heightened interest in these procedures. Short-scar face lifts and the MACS-lift technique in particular have grown in popularity and are now widely adopted by surgeons performing facial rejuvenation.

To reflect the widespread interest in these procedures, Drs. Tonnard and Verpaele have expanded the scope of this second volume to include not only their own approach to facial rejuvenation, but also that of other well-known authors who present their short-scar face-lift techniques. The reader is the beneficiary of this broadened perspective, gaining an enhanced understanding of the MACS-lift approach for facial rejuvenation, while learning about other surgical approaches, including lateral SMASectomy, formal sub-SMAS dissection, temporal lift by fasciapexy, and platysma suspension. The technical variations illustrated by expert surgeons utilizing short-scar techniques thereby offer the reader a plethora of choices for improving the appearance of the aging face—all with the advantages of shorter incisions, the potential for less scarring, and a quicker recovery. The authors also devote more attention to aesthestic analysis, operative strategies, and technical refinements with special emphasis on patient evaluation and how to vary operative techniques to accomplish the desired aesthetic outcome for each patient.

It is interesting to note that these minimal-incision procedures are part of a historical continuum representing the ongoing cycle of innovation that is synonymous with our specialty. From a personal perspective, I find the study of the first 100 years of face-lifting techniques a fascinating subject. In the early 1900s, when face lifting was first described, it consisted of basically limited incision approaches (as originally described by Joseph and Lexer). As greater experience was acquired, the incisions for these procedures became longer, extending into the postauricular region, as well as transcoronally across the scalp. As we approach a second century of facial rejuvenation, we find ourselves in some respects returning to where we started, utilizing limited and minimal-incisional techniques as described in this text. Not only has our incisional approach to facial rejuvenation changed, but also our approach to repositioning

facial fat has undergone similar redefinition in the 30 years following the work of Mitz and Peyronie. Our improved understanding of facial soft tissue anatomy has shaped facial rejuvenation techniques into what are commonly considered multiplane operations, consisting not only of skin envelope tightening, but also often formal sub-SMAS dissection as well as procedures that include subperiosteal dissection of the midface.

As can be seen in both of these volumes, the pendulum for repositioning of facial fat has again swung back and we are now tending toward more minimally invasive techniques, with a goal of limiting morbidity and increasing patient safety without compromising outcome. The many excellent results demonstrated by Drs. Tonnard and Verpaele as well as the other contributors in this volume illustrate that optimal results that are natural in appearance can be obtained through a variety of surgical and nonsurgical approaches, which work in synergy.

I would like to congratulate Drs. Tonnard and Verpaele on their significant contribution to the field of facial rejuvenation and specifically this excellent compilation of innovative approaches to facial aging. Surgeons today have multiple approaches to choose from for improving the facial appearance of their patients; these surgical techniques and cosmetic treatments share a common goal of enhancing facial contour while minimizing the visible signs of surgical correction. All surgical techniques have advantages, disadvantages, and limitations. What is important is to stay focused on the goal: the surgical solution must remain subservient to the aesthetic destination. Good surgeons can get good results through a variety of approaches as long as there is an understanding of how to vary the technique according to the aesthetic needs of the patient. Toward this aim, this book offers surgeons committed to excellence in facial rejuvenation many alternatives to help them reach their aesthetic goals.

James M. Stuzin, MD

Preface

This second volume on short-scar face lifting comes just 3 years after the publication of our debut volume on the MACS-lift short-scar rhytidectomy. In that short interval, the interest in less-invasive approaches to facial rejuvenation has grown exponentially with many new and exciting developments being reported by expert surgeons throughout the world. This new book seeks to build on that interest and to capture the contributions of other surgeons who share our belief in short-scar face lifting.

Thus this volume may be viewed as a companion to the first. It has its own unique characteristics and advances the concepts and techniques discussed earlier to a new level of understanding. What has become clear in writing this book is that the MACS-lift technique remains as beneficial and relevant as it was when we first described it in 2002, and we continue to fully endorse all of the principles developed in the first volume. Additionally, thanks to interaction with colleagues worldwide during many international meetings, we have come to recognize that many surgeons' ideas about the concept of facial rejuvenation and the ways to achieve it tend to converge. The trends in face lifting seem to focus on volume restoration, vertical vectors, limiting complications and face-lift stigmata, shortening downtime, and optimizing the risk/benefit ratio. Furthermore, it has become evident that the combination of different simple and effective surgical and nonsurgical approaches seems to work synergistically to deliver a result that is more than the sum of the contributing factors.

We remain convinced of the necessity of a patient-oriented approach to facial rejuvenation, paying close attention to the patient's individual needs and aging patterns. We must move away from a reliance on a standard recipe for facial rejuvenation. We now have tools that allow us to "treat" patients from age 30 to over 80 with more subtlety and flexibility rather than relying on the traditional reflex of "face-lift plus upper blepharoplasty." Botulinum toxin, fillers, nonablative photorejuvenation, radiofrequency, and other nonsurgical techniques offer interesting options for refining our approach to facial aging. Although all of these techniques have temporary and limited results, they are enormously appealing to the public because of their minimal downtime with reduced complications. It is therefore imperative for us to limit the downside of operative procedures while preserving their validity through effective and long-standing results. Obviously, the outcome of a rejuvenating treatment is not solely technique dependent. Correct preoperative aesthetic analysis is the key to determining the best techniques for achieving the desired result.

We believe that these two volumes contain valuable information for any surgeon involved in facial rejuvenation. Short-scar face lifting is a concept that is rapidly gaining popularity among facial aesthetic surgeons, and which is in need of in-depth analysis and detailed teaching. Hopefully these books will help to lower the threshold for performing minimally invasive face-lift surgery for young, inexperienced surgeons while providing technical pearls and insights to experienced surgeons who are accustomed to their established techniques. Correspondence from our colleagues reports shortened downtimes, improved natural results, and enhanced pleasure in operating after adopting some or all of the concepts of the MACS-lift and other short-scar face-lift techniques. It is our hope to convey some of this enthusiasm to our readers.

Volume II is a multiauthor work with contributions from eminent plastic surgeons dedicated to this field of work. The time was ripe for bringing together the ideas of different experts who, although they have various viewpoints and approaches, are all thinking in the same direction.

The book is divided into two parts. In the first part, the subject of short-scar face lifting is approached from different angles. We begin with a chapter on the power of short-scar face lifting in which we make the case for this approach to facial rejuvenation and explain the rationale behind the short-scar face lift—why this is not merely a face lift with a short scar. Next Dr. Foad Nahai provides his perspective and approach to the short-scar face lift. Drawing on his long-standing experience with a variety of techniques for facial rejuvenation, he identifies specific situations in which a minimally invasive approach is appropriate and effective.

The next three chapters focus on the MACS-lift technique. In Chapter 3, Dr. Joseph Hunstad relays his personal experience with the MACS-lift operation and explains how short-scar rhytidectomy can expand one's face-lift practice while improving patient satisfaction. In Chapter 4, we review the important lessons learned during 7 years of MACS-lifting, including an update on complications, problems, limitations, and technical tips and tricks. The biomechanics of the MACS-lift technique is addressed in Chapter 5 by Dr. Mark Jewell who compares suture suspension techniques with SMAS flap elevation approaches. This chapter provides the reader with valuable tips on how to succeed with the MACS-lift technique. Dr. Daniel Baker, a pioneer in short-scar face lifting for the last two decades, describes his personal technique of SMASectomy in Chapter 6, balancing it with other comparable and convergent techniques. One of his key messages is that suture techniques applied for sculpturing subcutaneous tissues are as effective as traditional SMAS flap undermining techniques.

Part II focuses on the various synergistic procedures that combine to produce exceptional results. It begins with the work of Drs. Daniel Labbé and Julien Nicolas in the anatomy lab that interestingly reveals the anatomic basis of minimally invasive neck correction by platysma suspension, based on the theory of

gliding planes in the aging of the neck. The dissections are extensively described, and the important clinical implications are pointed out.

Next Dr. Alain Fogli describes his simple and safe technique for temporal lifting by fasciapexy. His technique is a welcome addition to the MACS-lift, completing the facial rejuvenation in the superior third of the face, which we personally apply in a slightly modified version. Our personal experience with the short-scar temporal lift is described in Chapter 9. The book concludes with a chapter by Dr. Thomas Roberts III and colleagues who discuss how facial rejuvenation results can be optimized when specific procedures, such as facial sculpting with microfat grafting, facial liposuction, laser resurfacing, lateral canthal suspension, and subnasal lip lift, are used synergistically with classical or short-scar face-lifting techniques. The authors base their treatment on a detailed analysis of facial beauty and facial aging.

Similar to the first volume, this work is conceived as a technical guide of practical value—this time based on the experience of different experts. Although we have attempted to provide a consistent format throughout the book, we were careful to respect the individual styles of our contributors to enable them to deliver their messages freely. Each chapter contains a list of surgical pearls that point out in a concise, powerful manner the essence of each author's contribution. Ample clinical examples are included throughout to illustrate the clinical value of the work presented.

Our first volume, *The MACS-Lift Short-Scar Rhytidectomy,* was conceived as a clinical atlas, guiding the reader through the basics of the technique, and trying to provide a comprehensive understanding of the MACS-lift concept. This second volume is the natural evolution of the first, and is meant to bring the reader who has embraced this concept to the next level of understanding. It will also provide any surgeon involved in facial rejuvenation with an unprecedented wealth of "backstage" tips and tricks, as all the contributing authors have given the best of themselves to assist the reader in his or her quest for superior results and greater patient satisfaction. Although each volume can stand alone, they are planned to work hand-in-hand, and on several occasions there are references from the second volume to the first. To complement the material presented in this volume, we have included a video demonstrating operative technique as well as the expert anatomic dissections of Dr. Labbé.

This second volume, similar to the first, was conceived from the perceived necessity for natural, safe, uncomplicated, and reproducible facial rejuvenation techniques and the lack of structured teaching in this matter. It is our profound hope and desire that this work will continue to stimulate thinking about facial aging and its treatment in an open-minded way, and that our patients will be the ultimate beneficiaries of this dialogue.

Acknowledgments

Writing a book is a collaborative effort, with numerous people contributing to the final result. Thus we have many individuals to thank who have assisted us in making this second volume a reality. First, we would like to express our appreciation to all of the authors who have contributed to this work. We asked them because of their expertise in short-scar face lifting, recognizing that these were individuals whose schedules were already full with lecturing about their technique and publishing their ideas. We know that our request to contribute to this book with the short deadlines imposed was an extra burden laid on their shoulders. Each of their contributions is unique and will be extremely valuable to the reader of this second volume on short-scar face lifting; the very best of each author's knowledge has been presented here. We are very proud of this, and we greatly appreciate the genuine friendship of these experts.

Second, our thanks go to Karen Berger and the team at QMP, who have worked with us under very tight deadlines to ensure that this publication is the best it can be. Their expertise and responsiveness is truly appreciated. As a publisher Karen is an unquestioned leader in providing top quality medical publications, especially in the field of plastic surgery. Our working relationship has always been enjoyable, and Karen's coaching has been invaluable.

Third, we take this opportunity to express our great appreciation to all of our staff. Our secretaries, Conny Heugens, Lisa Vanderhaeghen, Ellen Verdonck, and our nurses, Christelle Wullaert, Nele Versijpt, and Kim Laroy, are irreplacable in taking work out of our hands and supporting us in every project, despite increased workloads or pressing deadlines. We are very fortunate to work with such an enthusiastic team.

Fourth, we want to express our gratitude to our patients who have graciously consented to the publication of their photographs. We realize it is harder to agree to the publication of a portrait than a picture of a body part. Our work would not be possible without their cooperation.

Finally, we want to thank our families, who have always supported us. We are also grateful to all of the colleagues we have met all over the world who have shared their comments and critiques of our work; their input has stimulated us to further elaborate our technique and the way we are teaching it.

Patrick L. Tonnard, MD
Alexis M. Verpaele, MD

Contents

Part I
Short-Scar Face-Lift Techniques

Part II
Combined Approaches and Synergistic Procedures

Short-Scar Face Lift

Operative Strategies and Techniques

Part I

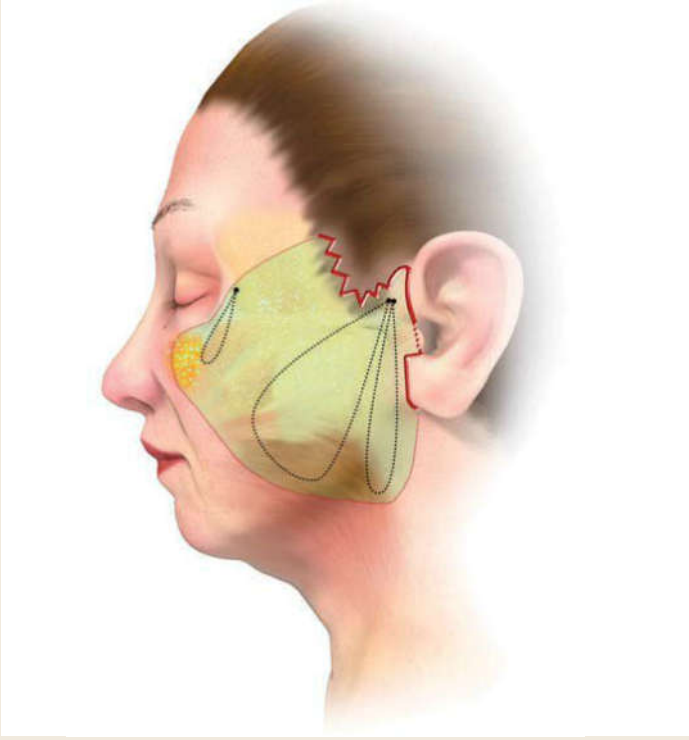
Short-Scar Face-Lift Techniques

Chapter

1

The Power of the Short-Scar Vertical Face Lift

Patrick L. Tonnard • Alexis M. Verpaele



It is remarkable how introducing the MACS-lift short-scar rhytidectomy into our practice has lowered the threshold for surgical facial rejuvenation. Although the term *face lift* has a rather negative connotation in Belgium, and to a lesser degree in Europe, the public embraced the reduced risk and morbidity of the MACS-lift. In addition, the reduced stigmata and very natural results are not only self-evident but are being spread by word of mouth. In a country where medical publicity is virtually prohibited, this is the most important publicity channel. We are surprised how well known the term *MACS-lift* has become as more and more patients specifically ask for this procedure. Patients are referred by friends or family members who are enthusiastic about the local anesthesia, the quick recovery, and primarily the absence of a "face-lifted" look.

It seems logical that the more invasive and radical a face-lift procedure is, the more dramatic and long-lasting the effect would be. This is true to a certain point, beyond which extending the invasiveness of the surgery may increase the risk of complications and yield an unnatural result, with only a marginal gain in rejuvenative effect. It has become clear that more complex and risky procedures are not a guarantee for longevity of results. The twin study carried out by Baker from 1996 to 2006 has shown very comparable results between the more and less invasive procedures.

Minimally invasive procedures are gaining in popularity in all surgical fields. At one end of the spectrum we see a tremendous boom in scarless facial rejuvenation techniques, including radiofrequency techniques, the so-called *barbed-wire interventions,* and those that use nonablative light and laser devices. These devices are very heavily marketed and are very appealing because of the immediate effect and reduced down time. Nevertheless, none of them is capable of reproducing the quality and longevity of a traditional face-lift. The MACS-lift fits well between these two extremes of the invasiveness spectrum because it manages to reduce downtime and morbidity, while preserving the quality and stability of the result.

A scar is the hallmark of a surgical intervention and is therefore unwanted by the patient. Even in the best hands, in ideal circumstances, and with perfect tissue quality, a scar is undesirable and eventually impossible to erase. Therefore shortening the scar must be a goal in itself, but without compromising the quality and longevity of the results.

We found that in most cases we can obtain a very satisfying result without extending the scar behind the ear or into the temporal hair. Initially, we thought that a short scar would only be possible in younger patients (40 to 50 years), but with experience it became obvious that the MACS-lift was also rewarding for patients in their sixties and seventies, depending on the quality of their skin. There are situations, however, in which the extent of the deformity requires additional efforts, sometimes resulting in a longer scar. In these exceptional cases a long scar is legitimate because it is unavoidable.

It is remarkable that after approximately a century of facial rejuvenation surgery there is still debate about the mechanism of facial aging. The process is most likely attributable to several synergistic factors, which explains why combining different approaches (for example, lifting together with filling procedures) often delivers superior results. We are sure of one thing: aging doesn't result from a forward movement of facial tissues. Therefore it seems illogical that moving facial tissues in a posterior direction would restore a youthful appearance. This explains why excessive lateral pull on deep tissues or skin produces a strange, unnatural appearance, especially when evaluating long-term results. For this reason, avoiding lateral traction is mandatory. The MACS-lift has been conceived as a pure vertical-vector face-lift technique for the deep tissues and skin.

The following paragraphs (pp. 6-11) provide an overview of the underlying principles and operative steps of the MACS-lift technique. Individual steps are illustrated.

OPERATIVE OVERVIEW
Principles

The MACS-lift is a short-scar face lift that elevates the deep tissues and skin, using a vertical vector only. Sagging facial soft tissues are suspended with permanent or slowly resorbable purse-string sutures that are strongly anchored to the deep temporal fascia through a preauricular and temporal prehairline incision. The following two variations of the procedure are possible:

- The simple MACS-lift (S-MACS): Two purse-string sutures are placed to correct the neck and lower third of the face (cervicomental angle, jowling, and marionette grooves).
- The extended MACS-lift (X-MACS): A supplementary (third) purse-string suture is used to suspend the malar fat pad. This suture will have an extra effect on the nasolabial groove, the midface, and the lower eyelid.

Operative Sequence

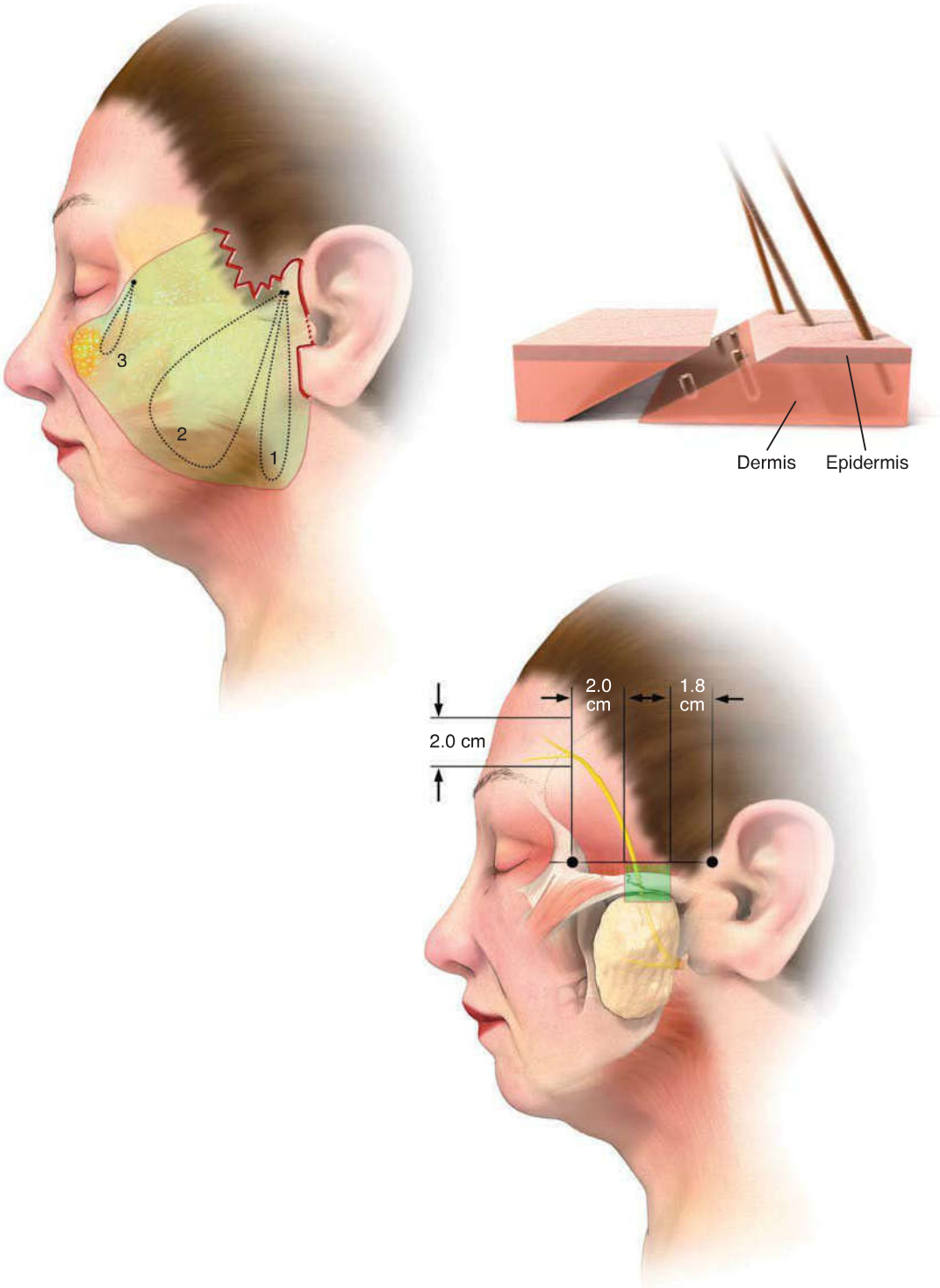
We begin to mark the incision at the lower limit of the lobule, and extend it up into the preauricular crease. At the level of the incisura intertragica, we angle the marking 90 degrees posterior to preserve the integrity of this anatomic landmark. The marking is continued along the posterior edge of the tragus and ascends toward the helical root. At the superior limit of the ear, the marking follows the small hairless recess between the sideburn and the auricle, and then turns downward to follow the inferior hairline of the sideburn.

In men, the marking descends approximately 1.5 cm before turning anteriorly to cross the sideburn. We continue the marking forward in a zigzag pattern 2 mm within the lower and anterior hairline of the sideburn. In this part of the incision, we incline the knife at an angle almost tangential with the skin to cut hair shafts perpendicularly. This maneuver will allow hair to grow through the scar. After hair regrowth, the final scar will be hidden a few millimeters within the hairline and become virtually invisible. The purpose of the zigzag pattern is to increase the length of the temporal incision for better fit with the length of the cheek flap, thereby reducing dog-ear formation. In the simple MACS-lift, the incision will extend to the level of the lateral canthus. In an extended MACS-lift, the incision extends to the level of the tail of the eyebrow.

Preoperative Marking: Undermining

We palpate the mandibular angle with the index finger and mark this as the lowest point of undermining. The extent of the undermining is then marked starting from the lowest point of the incision at the lobule, extending toward the marking of the mandibular angle, and then curving anteriorly to 5 to 6 cm

in front of the ear. With an extended MACS-lift, the undermining of the malar eminence is included in the demarcation. We undermine the skin using Rees-type face-lift scissors in the subcutaneous plane. The anchor points for the purse-string sutures are within the deep temporal fascia above the zygomatic arch, in a safe zone out of the path of the frontal branch of the facial nerve.



The First Purse-String Suture: The Vertical Loop

To make the first purse-string suture, we use iris scissors to create a window 0.5 cm in diameter in the subcutaneous tissue, 1 cm above the zygomatic arch and 1 cm in front of the helical rim to expose the deep temporal fascia. We use a 1-0 PDS suture on a large, round CT3 needle. The first bite is taken at the point where the deep temporal fascia is visualized, and extends down to the temporal bone. We orient the needle toward the tragus to avoid damaging a facial nerve branch. We take firm bites 1 to 1.5 cm long and 0.5 cm deep in the superficial musculoaponeurotic system (SMAS) tissue, which consists of parotid fascia in the upper two thirds and platysma in the lower one third.

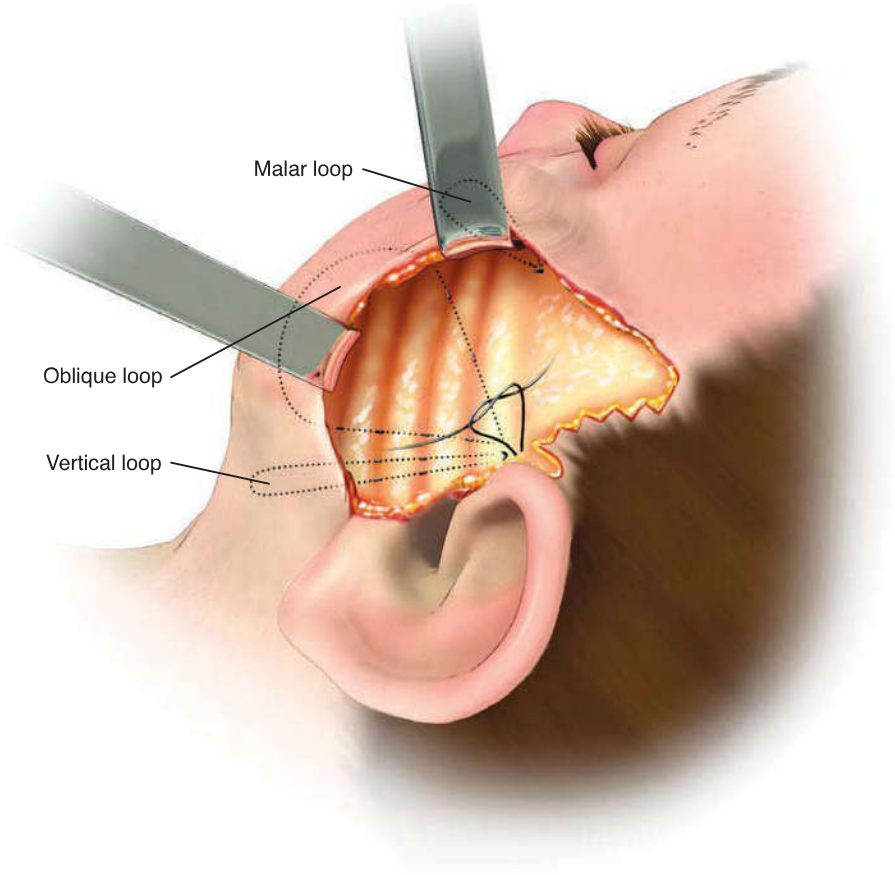
We suture down to the lower limit of the undermining. There, we take two or three solid bites in the cranial edge of the platysma muscle. Sometimes this requires extending the underminings for 1 to 2 cm caudally until the platysmal border is well visualized. At this point, suturing is directed upward and continues back to the starting point. This creates a narrow U-shaped purse-string loop with a width of about 1 cm. We tie the knot under maximal tension.

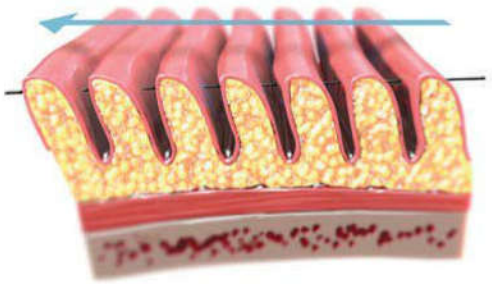
The Second Purse-String Suture: The Oblique Loop

The second purse-string suture originates from the same location as the first on the deep temporal fascia, forming a wider loop directed toward the jowl area at an angle of 30 degrees with the vertical loop. This loop is more O-shaped (compared with the U-shaped vertical loop) to prevent linear traction on the subcutaneous tissue, which could be visible through the skin. The loop follows the borders of the anterior undermining in the lower part of the cheek. We take short bites (maximum of 1 cm) in the parotid fascia and the SMAS tissue. We then tie the knot under maximal tension.

The Third Purse-String Suture: The Malar Loop

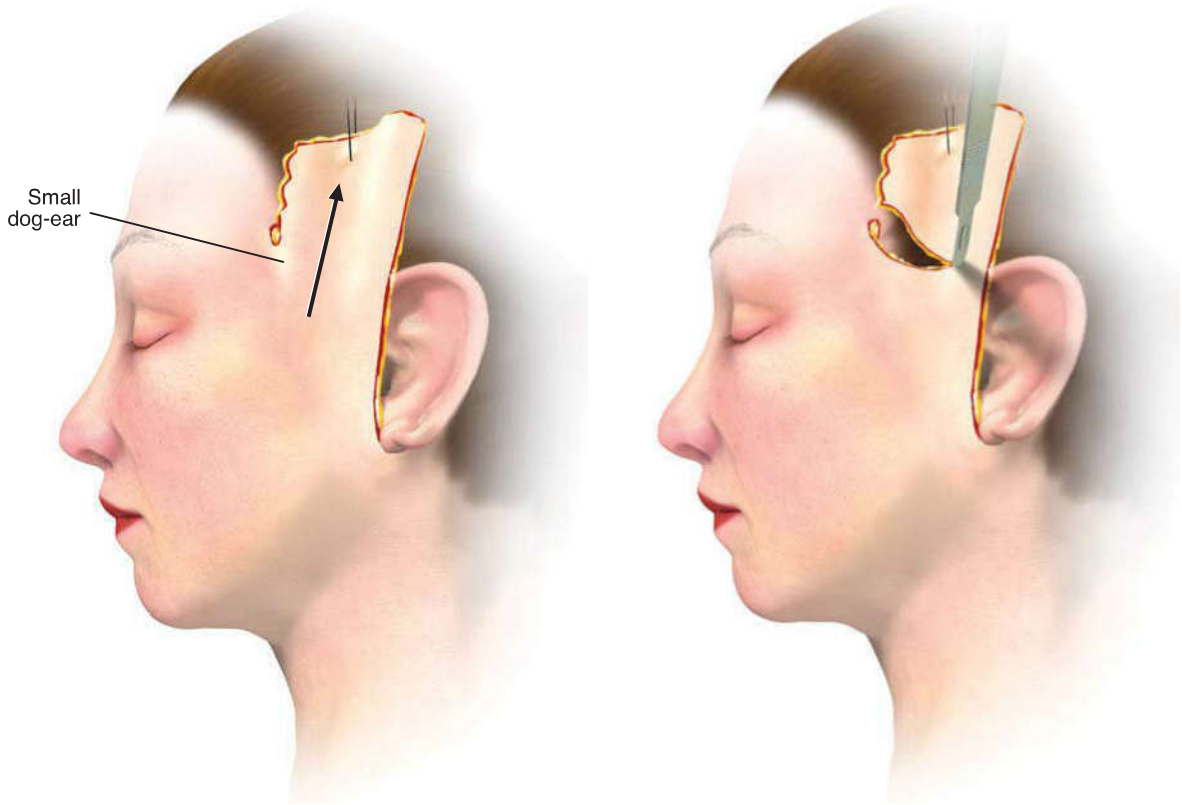
The third suture has a separate anchor point on the deep temporal fascia, just lateral to the lateral orbital rim in front of the path of the frontal branch of the facial nerve. Here, we make a window in the orbicularis muscle down to the deep temporal fascia. We take a deep bite, anchoring the suture to the deep temporal fascia. The purse-string suture is oriented obliquely downward and medially toward the malar fat pad, which is recognizable by its more fibrous consistency than the surrounding subcutaneous fat. At the preoperatively marked point 2 cm below the lateral canthus, we reverse the direction of suturing upward and lateral. The loop has a narrow U-shape and ends at its starting anchor point. The knot is tied under maximal tension.





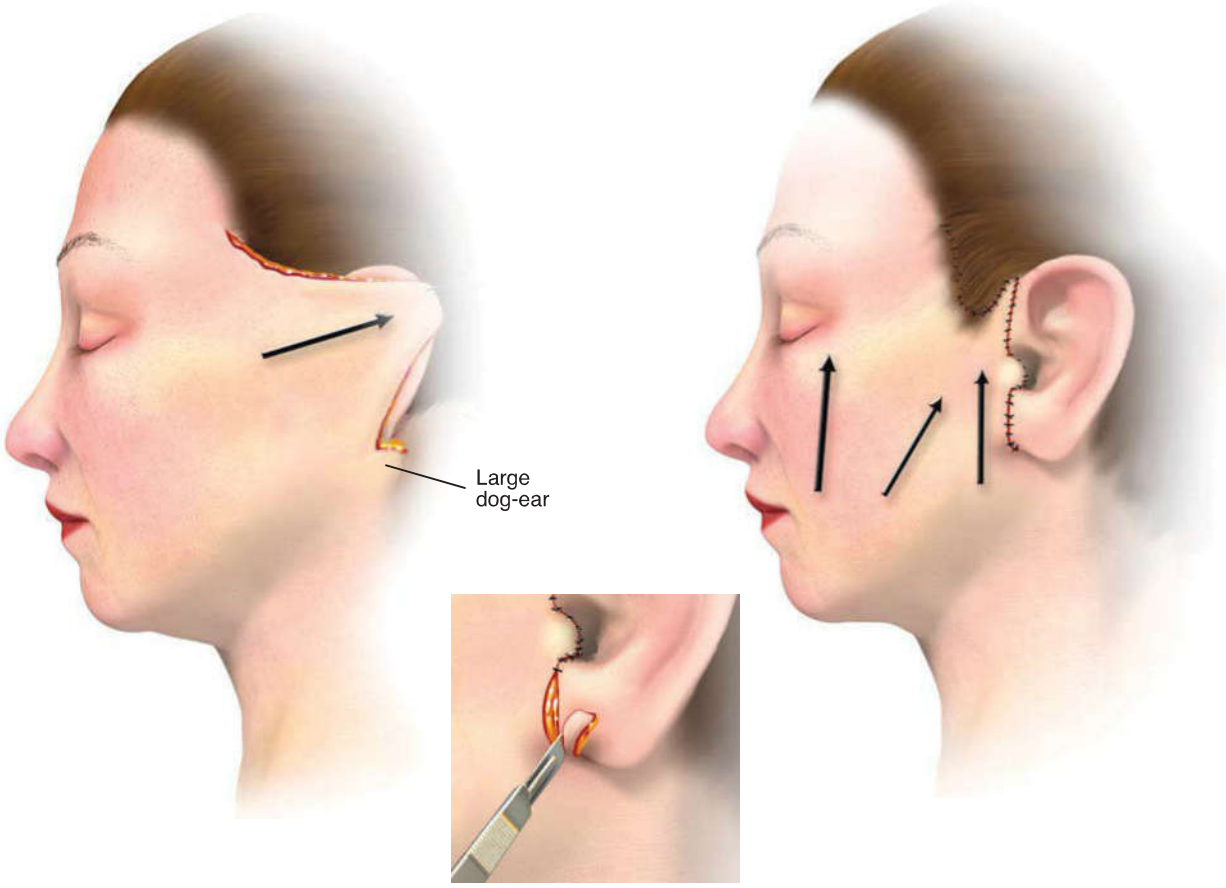
Skin Redraping

One of the most important features of this short-scar face lift is vertical skin redraping. Because the vector of SMAS suspension is almost purely vertical, redraping and resection of the skin in the same direction will seal the underlying subcutaneous sculpting effect. In classical face lifting, there is always a horizontal component of skin redraping that causes skin excess in the earlobe region, necessitating a retroauricular incision for skin redraping.



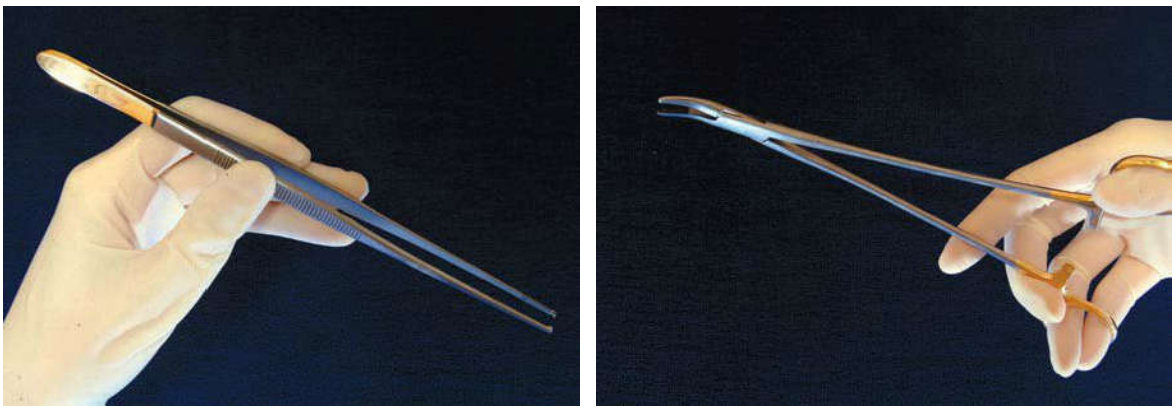
Skin Resection

We resect skin on the cheek flap in a curvilinear fashion and suture it to the zigzag border of the temporal hairline incision. The zigzag incision will now open up when coapting with the linear cheek flap, thereby compensating for the incongruence in length of both borders and also reducing possible dog-ears. We set back the pulled up earlobe into the cheek flap. We begin closure with interrupted 4-0 Vicryl buried sutures at the superior end of the incision. We suture the horizontal limb of the incision with a running 5-0 nylon horizontal mattress suture, taking bigger bites on the cheek flap side than on the temporal side to compensate for the final incongruence in length between both sides. We insert a small, hollow, silicone drainage tube at the lowest point of the incision to drain into the loose retroauricular dressing during the first 24 hours, after which it is removed along with all dressings. The rest of the suturing is performed with running 6-0 nylon sutures.



Instruments

To facilitate MACS-lift surgery through a short incision, two instruments (Micrins Surgical, Inc., Lake Forest, IL) were optionally modified. The forceps is 20 cm long with a strong, 2 mm wide, flat, diamond platform. It is particularly helpful for deep work at the platysmal border, where it easily grasps the heavy needle with 0 PDS suture. The needle-holder is 20 cm long with a curved tip, which enhances visualization of the top of the instrument while working in the narrow tunnel through the short-scar incision.



CASE EXAMPLES

After 7 years of performing MACS-lifts, we have become aware of the stability of the result compared with traditional face-lift techniques. The first patient described presents an example of this stability. She was treated very early in our MACS-lift series and was also presented in the first volume (see p. 174). Her results have persisted and still appear natural, despite subsequent age-related changes.

Aesthetic Analysis

This 51-year-old woman was operated on 6 years ago. She presented with very moderate laxity of the upper neck and the start of jowling. Her treatment was performed under local anesthesia with intramuscular midazolam sedation.

Surgical Plan

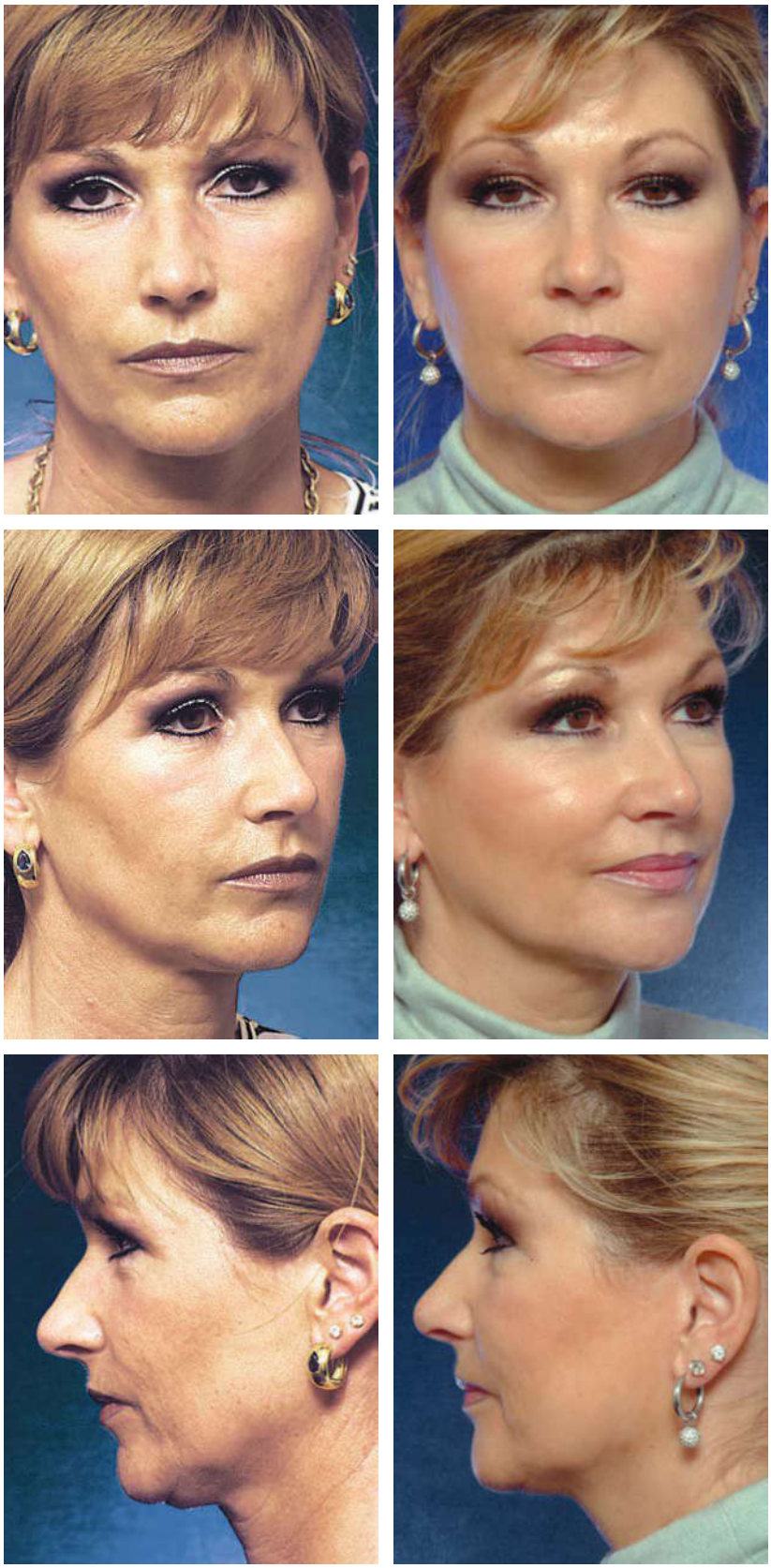
The treatment consisted of:

- A simple MACS-lift
- Limited submental liposculpture

Postoperative Results

Presently, she has a good oval facial shape, with slight recurrence of jowling caused partly by a gain of 3 kg in body weight. The cervicomental angle is still significantly better than it was preoperatively. The inframalar hollow is still nicely corrected.

It is important to note that although the aging process continued after the procedure, odd face-lift stigmata such as the lateral sweep phenomenon were not apparent. The vertical vector contributed remarkably to the shortening of the scar, rendering retroauricular dissection obsolete. Adherence to this principle in nearly 700 patients since 1999 has never disappointed us.



The next five cases present typical indications for a simple MACS-lift. The last five cases benefited from the additional midface correction offered by an extended MACS-lift.

Aesthetic Analysis

This 45-year-old woman had a deflated appearance of the lower half of her face, mild laxity of her upper neck and submental region, and a "hardened" gaze.

She had moderate jowling, an onset of submental laxity without platysmal bands, and marionette grooves (mainly visible in the profile view). She has a good midfacial shape, except for an inframalar hollow in the cheek. There was moderate herniation of the lower orbital fat, an upper blepharochalasis with the loose upper eyelid skin resting on the upper cilia, herniation of the upper medial fat pad, and a glabellar frown line. The position of the eyebrows was adequate.

The procedure was done under local anesthesia with intramuscular midazolam sedation (3 mg) and took 2 hours. The patient was discharged 2 hours postoperatively.

Nonsurgical Plan

The treatment consisted of:

- Botulinum toxin to the corrugator and depressor supercilii muscles

Surgical Plan

The treatment consisted of:

- Submental liposuction with removal of fat between neck skin and platysma muscle and some fat removal from the jowls
- A simple MACS-lift
- A lower lid transconjunctival fat removal
- An upper blepharoplasty with resection of skin and orbicularis muscle, and conservative removal of fat from the medial compartment

Postoperative Results

The 1-year postoperative results are shown. The frontal view shows a restoration of the lower facial shape with a well-defined mandibular border and correction of the jowling and marionette grooves. Lower eyelid bulging and upper eyelid blepharochalasis are corrected, and the glabellar region is softened.

In the oblique view, better definition of the mandibular border and improved fullness of the cheek are evident, thanks to vertical repositioning of lower facial volumes. In the profile view, the flat submental area and the crisp cervicomental angle are obvious. Also note the good quality of the scar and the natural aspect of the temporal hairline.

Aesthetic Analysis

This 52-year-old woman wanted facial rejuvenation with minimal invasiveness. She was hoping that a nonsurgical treatment could be offered to her. She presented with moderate upper neck and submental laxity with a small platysmal band on the left side. The patient had obvious jowls, marionette grooves, and upper lip rhytids, with a youthful midface and very fine rhytids in the lower eyelid. She had undergone an upper blepharoplasty 5 years before.

This procedure was performed under local anesthesia with intramuscular midazolam relaxation (2.5 mg) and took 1 hour and 55 minutes. The patient was discharged 2 hours after surgery.

Surgical Plan

The treatment consisted of:

- A simple MACS-lift
- Submental liposculpture
- Erbium:YAG laser resurfacing of the upper lip and corners of the mouth
- A lower eyelid pinch blepharoplasty

Postoperative Results

Results are shown 1 year postoperatively. The rejuvenating effects seen in the lower third of the face include correction of the submental and upper neck laxity and of the platysmal band on the left side, disappearance of the jowls and marionette grooves with better definition of the mandibular line, and eradication of perioral rhytids. Note also the pleasing augmentation effect in the zygomatic region that can be obtained even with a simple MACS-lift. A lower eyelid pinch blepharoplasty was added to the procedure, which is seldom done in a simple MACS-lift case. At the end of the procedure, extra skin that gathers in the lower eyelid as a result of the vertical lift can safely be removed. In this case, 4 mm of skin was removed especially in the paracanthal region. This extra intervention produces minimal morbidity (see the 1-week postoperative photos). The postoperative profile view with downward gazing shows adequate and stable correction of the cervicomental angle. Retroauricular skin wrinkling is improved without any incision or dissection behind the ear.

This patient is a candidate for chin augmentation (with a chin implant). However, she was not interested in undergoing this procedure. Although less invasive than classical extended face lifting, a simple MACS-lift causes some morbidity. When sutures were removed 1 week postoperatively, some bruising in the neck and lower eyelids was visible, along with swelling in the region below the earlobe. In this thin-skinned patient, a fold of platysma muscle is visible as a result of upward suspension suturing of the first loop. This becomes less apparent in the second postoperative week. Subciliary and paracanthal scars from the pinch blepharoplasty produce minimal extra morbidity. The resurfaced area on the upper lip and corners of the mouth is almost completely reepithelialized at 1 week. At this time, the petrolatum/paraffin dressing is replaced by a different hydrating cream and sunblock, and later makeup can be added.

1 week postoperatively

Aesthetic Analysis

This 54-year-old woman requested correction of the features that made her look older. She wanted to concentrate on the lower part of her face and did not want to undergo any procedure that involved general anesthesia. She had undergone upper eyelid surgery elsewhere 5 years earlier. She had a round, heavy face with obvious fatty infiltration of the neck.

With this patient, the question arose whether to open the neck and perform an open lipectomy with elaborate work on the platysma muscle, such as platysmarrhaphy. The most dramatic results can undoubtedly be obtained by opening the neck. There is the potential for higher morbidity, including longer convalescence and postoperative hematoma. Each case has to be addressed individually and discussed with the patient. In this case, it was decided not to open the neck because of the patient's reluctance to undergo general anesthesia.

This procedure was performed under local anesthesia with intramuscular midazolam relaxation (4 mg) and took 2 hours and 15 minutes. The patient was discharged 2 hours after surgery.

Surgical Plan

The treatment consisted of:

- Extensive submental and jowl liposculpture with a power-assisted liposuction (PAL) device
- A simple MACS-lift
- A lower eyelid pinch blepharoplasty
- Erbium:YAG laser resurfacing of the perioral rhytids 18 months after surgery

Postoperative Results

The 18-month postoperative results show a marked change in the overall shape of the face from round to more oval. Results for the cervicomental angle and the definition of the mandibular border are very satisfying in view of the limited work that was done on the neck (only liposculpture). The possible gain that could have been obtained by opening the neck is debatable, considering the potential risks and added morbidity.

The effect on the midface and lower eyelids is visible but moderate. The temporal hooding at the lateral part of the eyebrow that is visible preoperatively is not corrected by a MACS-lift and requires a temporal lift (see Chapters 8 and 9). The quality of the scar is good in the preauricular and temporal regions.

Aesthetic Analysis

This 47-year-old woman presented primarily for a rhinoplasty and requested information about modalities for facial rejuvenation. She had some fatty infiltration of the submental area without any platysmal bands. Moderate jowling was present; the architecture of her midface was good. She also had some upper blepharochalasis, with the upper eyelid skin almost touching the cilia. Her nose showed a dorsal hump with slight deviation toward the right side and a broad tip.

This procedure was performed under general anesthesia and took 2½ hours. The patient was discharged the same day.

Surgical Plan

The treatment consisted of:

- Submental liposuction and suction of the jowls
- A simple MACS-lift
- An upper blepharoplasty
- Open rhinoplasty with reduction of the hump, lateral osteotomies, and a tip rhinoplasty with transdomal and interdomal sutures

Postoperative Results

The patient is shown 18 months after surgery. On frontal view, a change in the general shape of the face toward a more youthful, oval shape is seen. The nose has been refined and the upper blepharoplasty has provided a refreshing effect. The oblique view shows the sculpturing effect on the lower part of the face, accentuating the malar eminence. The improved cervicomental angle is seen on the downward-gazing profile. She is used to wearing her hair behind her ears and continues to do so after surgery, because the preauricular and temporal scars are almost invisible.

Aesthetic Analysis

This 43-year-old woman requested facial rejuvenation and was most concerned about her neck. She also presented for correction of a bulbous nasal tip and breast hyperplasia.

She had a heavy, fatty-infiltrated neck with neither a cervicomental angle nor mandibular definition. Her midface still had a youthful appearance. Old acne scars were visible on both cheeks.

The procedure was done under general anesthesia, took 2 hours, and was performed by two teams. The patient stayed overnight and was discharged the next day.

Surgical Plan

The treatment consisted of:

- Liposuction of the submental and jowl area
- A simple MACS-lift
- An upper blepharoplasty
- Endonasal tip rhinoplasty with reduction of the alar cartilages
- Breast reduction

Postoperative Results

The patient is shown 1 year after surgery. Most striking is the effect on the lower part of the face. Her cervicomental angle and the definition of the mandibular border were restored by simply suctioning the fat between the skin and platysma, and suspending the lateral border of the platysma. Anything more aggressive would have been overtreatment. The acne scars are also improved considerably as a result of tightening the cheek skin. These multiple surgeries could safely be combined because of the double-team approach.

Aesthetic Analysis

This 59-year-old woman presented for a minimally invasive facial rejuvenation procedure. The following features were most striking: the sun-damaged, fine, crêpey, elastotic skin with submental and upper neck laxity, jowling, sharp nasolabial folds extending into the marionette grooves, a descent of the midface with a low position of the malar fat pad, and a marked eyelid-cheek junction. She had moderate blepharochalasis of the upper eyelids.

This procedure was performed under local anesthesia with intramuscular midazolam relaxation (3 mg) and took 2 hours and 15 minutes. The patient was discharged 2 hours after surgery.

Nonsurgical Plan

The treatment consisted of:

- A Retin-A skin care program

Surgical Plan

The treatment consisted of:

- Submental liposuction
- An extended MACS-lift
- A lower pinch blepharoplasty
- An upper blepharoplasty

Postoperative Results

The 1-year postoperative results demonstrate correction of neck skin laxity down to the cricoid cartilage, with restoration of the cervicomental angle. Mandibular definition is restored by correction of the jowling. The marionette grooves have been eradicated and the nasolabial folds are less apparent. The midface is rejuvenated by lifting of the malar fat pad, and there is a clear shortening of the vertical height of the lower eyelid, thereby blending the eyelid-cheek junction. The upper eyelids are rejuvenated.

Aesthetic Analysis

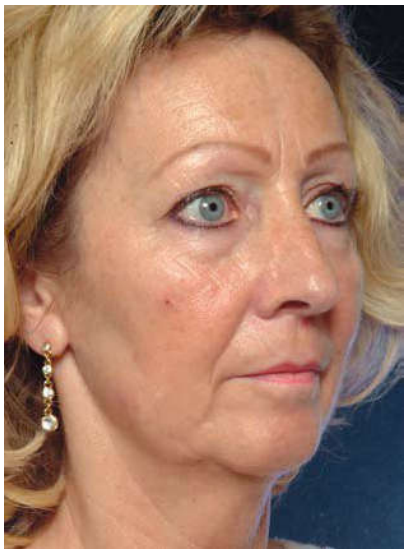
This 54-year-old woman requested minimally invasive facial rejuvenation under local anesthesia. She presented with an undefined cervicomental angle, jowls and marionette grooves, loss of definition of the jawline, a marked nasolabial fold, and flattening of the midface and zygomatic area. She had a moderate upper blepharochalasis and correct position of the eyebrows.

This procedure was performed under local anesthesia with intramuscular midazolam relaxation (3 mg) and took 2 hours and 15 minutes. The patient was discharged 2 hours after surgery.

Surgical Plan

The treatment consisted of:

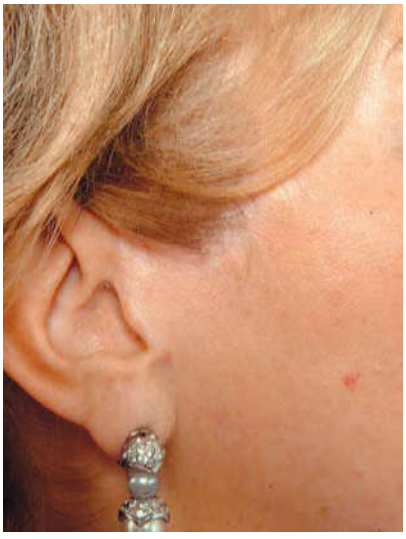
- Submental liposuction
- An extended MACS-lift
- An upper blepharoplasty with resection of skin and orbicularis oculi muscle and removal of fat from the medial and lateral compartment



Postoperative Results

Results are shown 1 day, 1 week, and 1½ years postoperatively. The series shows the progression of morbidity. She was able to resume her social activities after 10 days wearing makeup. At 1½ years, we see a stable correction of the jawline, jowls, marionette grooves, nasolabial folds, and midface. On the oblique view, a nice augmentation effect in the zygomatic area can be seen as well as a smoother transition from eyelid to cheek, with a shortening of the vertical height of the lower eyelid. On the profile view, slight relapse of the obtuseness of the cervicomental angle is evident. It is debatable whether more radical neck surgery could have resulted in a better long-term result. The quality of the preauricular and temporal hairline scars is adequate.

1 day postoperatively



1½ years postoperatively

Preoperative | 1 week postoperatively | 1½ years postoperatively

Aesthetic Analysis

This 55-year-old woman presented with mild laxity of the upper neck and submental region without platysmal bands. She had moderate jowling and marionette grooves, very marked nasolabial folds, and a loss of some volume in the midfacial region with a marked nasojugal groove. She had fine rhytids in the lower eyelids without fat herniation. She had upper blepharochalasis with the loose upper eyelid skin almost touching the upper cilia. The position of the eyebrows was adequate.

This procedure was performed under local anesthesia with intramuscular midazolam sedation (3 mg) and took 2 hours and 10 minutes. The patient was discharged 2 hours after surgery.

Surgical Plan

The treatment consisted of:

- Submental liposuction with removal of fat between neck skin and platysma muscle and some fat removal from the jowls
- An extended MACS-lift
- A lower eyelid pinch blepharoplasty
- An upper blepharoplasty with resection of skin and orbicularis muscle, and conservative removal of fat from the medial and lateral compartments

Postoperative Results

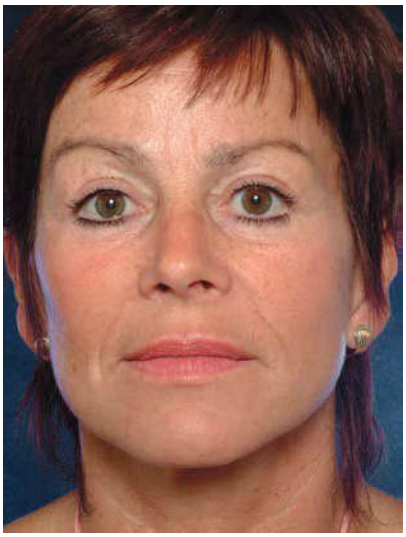
The patient is shown 1 and 2 years postoperatively. The frontal views show a general change in the shape of her face from rectangular to oval and correction of jowling and marionette grooves. The nasolabial folds are softened and the midface appears replenished. The vertical height of the lower eyelid is reduced and the lower eyelid skin is tightened. Upper eyelid blepharochalasis has been corrected.

In the oblique view, better definition of the mandibular border is visible as well as the augmentation effect in the zygomatic region resulting from cranial displacement of the malar fat pad. In the profile and downward-gazing views, tightening of the submental and upper neck region is obvious.

The minimal change between the 2-year and 1-year postoperative photos shows the stability of the result. There is minimal relaxation of the nasolabial fold, which can be corrected by freeing the fold with a V-shaped dissector and microfat transplantation. This additional treatment would be advised primarily in patients with a sharp nasolabial groove (see pp. 172-173).

Preoperative

1 year postoperatively



2 years postoperatively

Preoperative | 1 year postoperatively | 2 years postoperatively

Aesthetic Analysis

This 51-year-old woman presented for treatment of early signs of aging. As seen on the frontal view, there was a loss of sharp contours with a slight loss of definition of the mandibular border, marionette grooves, a downward slant to the corners of the mouth, cheek ptosis, and an increased length of the lower eyelid with a marked lid-cheek junction. There was a degree of upper blepharochalasis.

The oblique view reveals jowling and midfacial ptosis, with reduced malar projection and infraorbital hollowing. The profile view shows a blunted cervicomental angle and pronounced marionette grooves.

This procedure was performed under local anesthesia with intramuscular midazolam relaxation (3 mg) and took 2 hours and 10 minutes. The patient was discharged 2 hours after surgery.

Surgical Plan

The treatment consisted of:

- Submental liposuction
- An extended MACS-lift
- An upper blepharoplasty
- A lower pinch blepharoplasty

Postoperative Results

The patient is shown 1 year postoperatively. A well-defined mandibular border is seen, restoring a youthful oval shape. The marionette grooves have been completely corrected, and the corners of the mouth are lifted. The cheeks and midface are replenished, and the lower eyelids are shortened. The upper lid chalasis has been corrected.

In the oblique view, the most striking feature is the redistribution of midface volumes, with a better malar prominence and restoration of the facial ogee. Note the blending of the lid-cheek junction. In the profile and downward-gazing views, the sharpened cervicomental angle is seen, with the corrected marionette grooves and blending of the lid-cheek junction.

Aesthetic Analysis

This 67-year-old woman presented requesting facial rejuvenation with "the simple, less invasive technique." She wanted only surgery under local anesthesia and did not want us to touch her upper eyelid or eyebrows to avoid "changing her looks."

Despite her age, her facial architecture was still well maintained and her aging presented predominantly in the lower part of her face. Her midface and eyelid regions were very well conserved. She showed a skin laxity in the neck down to her sternal notch, with a heavy platysmal band on the right side. Her cervicomental angle was replaced by an oblique line consisting of skin and platysma muscle. She showed jowling with elastotic, crêpey skin on top of it and a downward slant to the corners of the mouth. She had moderate nasolabial grooves. Her midface and lower eyelids were fairly well maintained for her age. She had moderate upper blepharochalasis, with eyebrows in a correct position, although slightly ptotic laterally, producing some temporal hooding.

This procedure was performed under local anesthesia with intramuscular midazolam relaxation (3 mg) and took 2½ hours. The patient was discharged 2 hours after surgery.

Surgical Plan

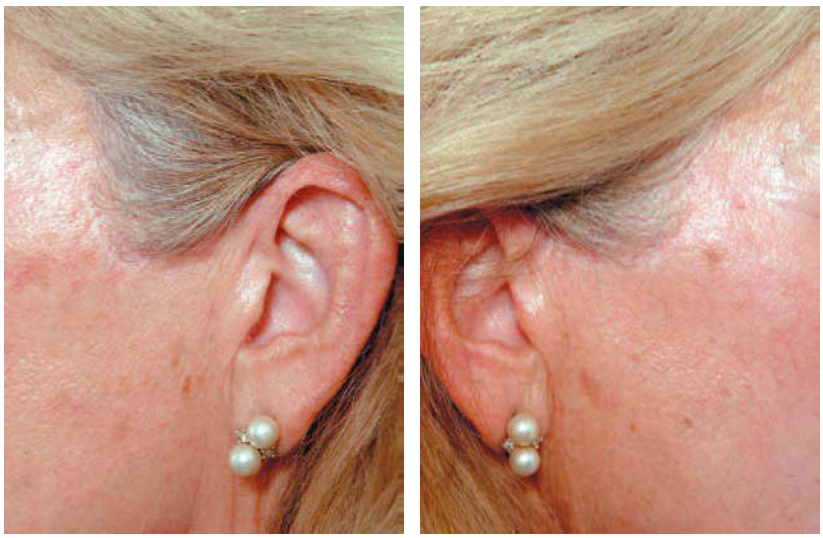
The treatment consisted of:

- Submental liposuction and suction of the jowls
- An extended MACS-lift
- A lower pinch blepharoplasty

Postoperative Results

Results are shown at 9 months, 1½ years, and 3 years after surgery. They show good stability with minimal relapse of the aging features. A natural and stable result is seen in the neck down to the sternal notch. On the profile view, minimal neck laxity has occurred over time, which can be attributed to normal aging processes. The jowls, marionette grooves, and nasolabial folds are nicely corrected. The midface shows a more youthful aspect to the malar volume. The lower eyelid is shorter in its vertical dimension and the skin is tighter. The upper eyelids and eyebrows did not change, because she had requested that these areas be left alone. Lateral hooding was not corrected; an additional temporal lift would definitely have given her a refreshed, more youthful look.

9 months postoperatively



3 years postoperatively

Preoperative | 1½ years postoperatively | 3 years postoperatively

BIBLIOGRAPHY

Baker DC, Hamra ST, Owsley JQ, et al. Ten-year follow-up on the twin study. Presented at the Annual Meeting of the American Society for Aesthetic Plastic Surgery, New Orleans, April 2005.

Besins T. The "R.A.R.E." technique (reverse and repositioning effect): The renaissance of the aging face and neck. Aesthetic Plast Surg 28:127-142, 2004.

Coleman SR. Structural Fat Grafting. St Louis: Quality Medical Publishing, 2004, pp 295-297.

Gonzàlez-Ulloa M, Flores ES. Senility of the face—basic study to understand its causes and effects. Plast Reconstr Surg 36:239-246, 1965.

Paul MD. Using barbed sutures in open/subperiosteal midface lifting. Aesthetic Surg J 26:725-732, 2006.

Pessa JE. An algorithm of facial aging: Verification of Lambros' theory by three-dimensional stereolithography, with reference to the pathogenesis of midfacial aging, scleral show, and the lateral suborbital trough deformity. Plast Reconstr Surg 106:479-488, 2000.

Wu WTL. Barbed sutures in facial rejuvenation. Aesthetic Surg J 24:582-587, 2004.

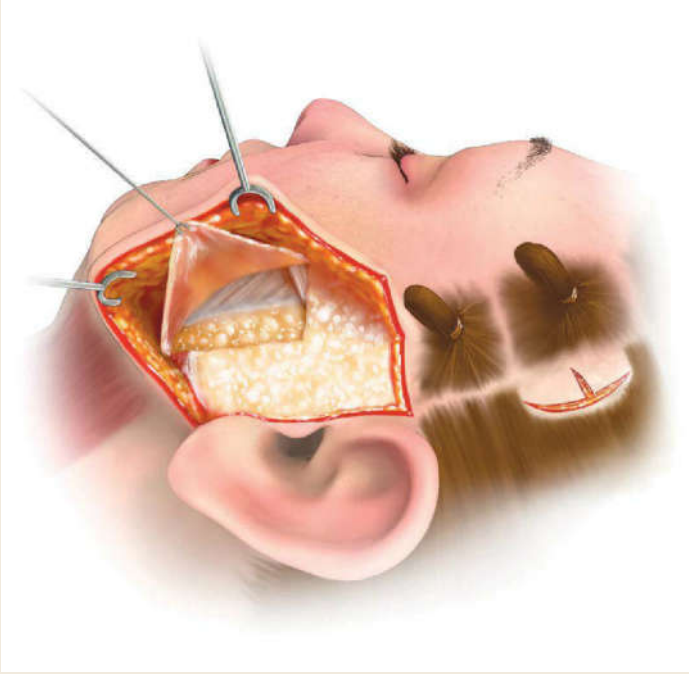
Chapter

2

Short-Scar Face Lift

Indications and Technical Considerations

Foad Nahai



Short-scar face-lift techniques have become an increasingly popular option for patients who seek facial rejuvenation with reduced morbidity, shorter scars, and minimal disruption to their lives. The MACS-lift, S-lift, lateral SMASectomy, and numerous other procedures have been developed to appeal to a broader audience of patients of all ages who desire an operation that produces a more dramatic and long-lasting result than can be achieved with fillers and Botox, but is less invasive with shorter scars than traditional face-lift procedures. Understanding the appropriate indications for a short-scar procedure is essential to achieving optimal rejuvenation and to meeting patient expectations.

Why Do We Make Incisions?

1. To resect skin
2. To gain access to deeper tissues
3. To do both

In Bostwick J III, Eaves FE, Nahai F. Endoscopic Plastic Surgery. St Louis: Quality Medical Publishing, 1995.

My current interest in short-scar face lift dates back to the early days of endoscopic plastic surgery at Emory University. As we sought to master minimally invasive techniques, we were forced to ponder the purpose of our incisions—whether to resect skin, gain access to deeper tissues, or both? The answer ultimately influenced the planning of our operations, because we discovered this: If the incision were only for access, it could be significantly shortened! This axiom applies to all aspects of aesthetic and reconstructive surgery; any incision that serves merely as access to the deeper tissues can be substantially reduced regardless of whether it is used for facial surgery, breast surgery, or body contouring.

This patient underwent an endoscopic neck lift, including platysma plication and neck suspension sutures through a 4 cm submental incision and a 1 cm retroauricular incision on each side. There was no skin excision.

A similar procedure was performed on this patient, who had platysma bands and apparent excess skin in the submental area.

My current technique for short-scar face lift reflects the understanding that it is possible to recontour the neck; manipulate the fat above and below the platysma, the digastric muscles, and the submandibular gland; and plicate the muscles without making extensive incisions as long as skin resection is not required. Ultimately, in patient selection, *it is all about the skin,* and the decision to shorten the scars depends on the skin's quality and quantity. If the patient has minimal excess skin with normal elasticity, permitting it to redrape and redistribute, a limited-incision or endoscopic neck or face lift should be success-

ful. However, if the patient has a significant amount of excess skin and the quality of the skin is poor with loss of elasticity, the results will not be as pleasing, because the skin excess will persist despite the deep tissue recontouring.

Based on that experience, it is clear that the role of the skin is paramount in selection of patients for a short-scar face lift. It is not only the amount or location of the excess skin that is important, but also the quality of the skin.*

BENEFITS OF SHORT-SCAR FACE LIFT

What are the benefits from reducing the length of our incisions? Why should the length of the scar concern us, if the patient has a good result that is pleasing? This thinking is acceptable if the scar is well hidden and heals without incident, but that is not always the case. In my experience, the preauricular and pretragal scars always heal well. It is usually the scars behind the ear and those extending into the hairline that have the tendency to develop scar hypertrophy and drifting from the retroauricular sulcus. There is also a greater risk of hairline misalignment behind the ear.

Note the hypertrophic postauricular scar with significant drifting away from the postauricular sulcus that is demonstrated in this face-lift patient.

* *It's all about the skin: skin quality, skin quantity.* In Bostwick J III, Eaves FE, Nahai F. Endoscopic Plastic Surgery. St Louis: Quality Medical Publishing, 1995.

It is argued that excessive tension during closure is a contributing factor to hypertrophy and that elimination of tension would also eliminate this possible complication. Despite these explanations, I believe that the ability to avoid scar hypertrophy and migration altogether with a short-scar face lift makes this an appealing option for properly chosen candidates. These are the compelling reasons why many patients prefer short-scar techniques and why many surgeons are now performing them. These are also the reasons why the effort to perform a short-scar face lift is worthwhile. However, compromise of the result to keep the scar short is not in the best interest of the patient. In the current environment in which the demand for short-scar and minimally invasive procedures is often driven by media interest and hype, it is important to keep the indications for short-scar procedures clearly in mind to ensure that the patient undergoes a procedure that provides the best chance for success.

INDICATIONS AND DECISIONS

Experience with endoscopic facial surgery teaches us that it is possible to perform most surgical procedures in the neck through minimal incisions. Furthermore, if the incision is for access only, it can be significantly shortened or even eliminated, thereby allowing the normal skin to redrape and redistribute. However, patients with excess skin or skin of poor quality will require resection and longer incisions. Thus the decision to proceed with a short-scar face lift is based on a careful evaluation of the neck skin.

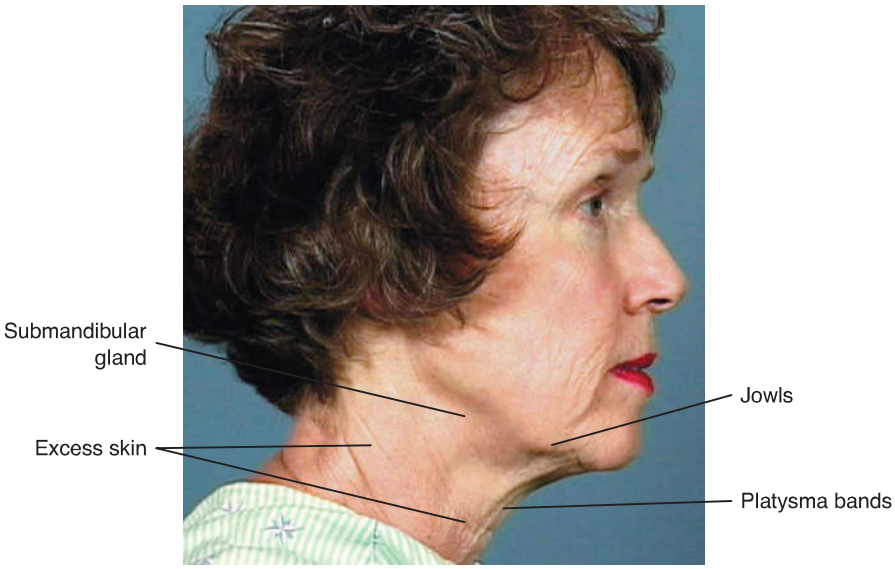
Management of the skin in the neck differs from management of facial skin, because the neck affords more options for skin redraping and skin redistribution. Excellent results in neck recontouring and neck rejuvenation are possible without skin excision.

The key to a good result is to assess the skin of the neck and establish whether the excess, if any, is real or apparent. If there is no excess, the entire neck procedure is performed through minimal incisions. If there is real excess skin, it is important to determine the location and quality of this excess skin. The length of the skin incision in neck lifting reflects the location of the excess skin to be removed.

Apparent excess skin will redrape following tissue recontouring below the skin, such as submental skin following fat removal in all three planes or digastric and submandibular gland excision. However, the skin must have sufficient elasticity to redrape. It represents the long side of the triangle redraping into the two shorter sides, thus eliminating apparent skin excess.

Skin redraping is demonstrated following fat removal and platysma plication through a submental incision. A short preauricular incision was used to tighten the SMAS and to improve on the jowls and jawline. No skin was excised from the neck.

Real excess skin rarely exists in the submental area. However, when present, it will necessitate a full-scar face lift. In my experience, the real excess skin requiring a full scar is usually found in the lower neck below the level of the thyroid and laterally over the sternomastoid muscle and behind it. During the examination, the surgeon should determine areas where real excess skin exists; the quality of the skin must also be assessed. Normal skin elasticity is essential for all short-scar procedures. Patients who have inelastic, sun-damaged skin must have the full retroauricular incision for a good result.

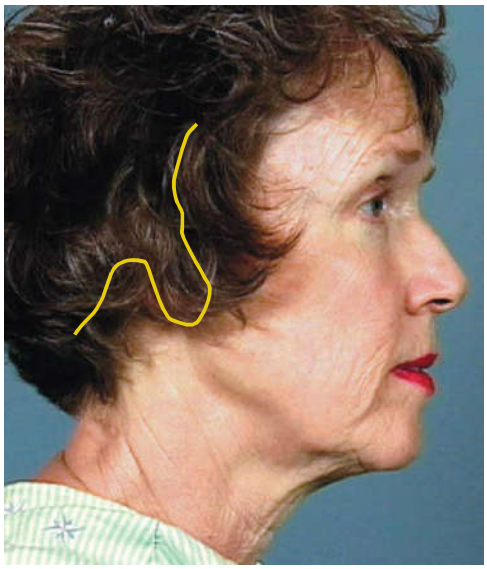


This patient has poor skin elasticity, as evidenced by her skin's sun-damaged appearance. She also has skin excess below the level of the thyroid cartilage and along and behind the sternomastoid muscle. A full face-lift incision, including a retroauricular extension, is required for an optimal result.

Evaluation of the Face for Planning Vectors and Incisions

The skin evaluation also influences my choice of vectors. The vertical vector applied to the neck in combination with a face lift with vertical SMAS and vertical skin elevation will define and improve the jawline and, to a certain extent, the submental area. The more diagonal vector required for skin resection in the retroauricular area will define and improve the lower and lateral neck when a full-scar approach is indicated.

Vectors



Incision for full-scar open approach

The black arrows denote the vectors for deep tissue, SMAS, and platysma plication. The red arrows reflect the vectors, vertical for the face and diagonal posteriorly for the neck. Given the lack of elasticity of the skin and the location of the excess skin, this patient in my hands is not a good candidate for a short-scar face lift.

The Ideal Candidate

The ideal candidate for a short-scar face and neck lift has normal skin quality with normal elasticity and no real excess skin in the neck. The patient will demonstrate jowls and aging of the neck-face interface.

This patient exhibits jowling and facial aging, even though her skin has normal elasticity and is not in excess (an ideal candidate for a short-scar procedure). The vectors for deep tissue and skin plication are demonstrated, and the proposed short-scar incision is outlined.

The patient is shown 4 years postoperatively; her jowling has been eliminated and a pleasing recontouring of the submental area and jawline has been accomplished. The natural appearance and projection of the tragus have been preserved. The retroauricular view is shown 1 year postoperatively.

One of the most useful methods for preoperative evaluation of the patient as a candidate for a short-scar procedure is to vertically elevate the skin on the side of the patient's face just in front of the tragus, thereby simulating the vertical vectors of the short-scar face lift. With my hand elevating this tissue, I observe the junction of the earlobe and the neck skin. If there are no folds of excess skin extending posteriorly beyond that area, the patient is an excellent candidate for a short-scar face lift. If there is excess skin or a fold develops there, then the patient is best suited to a full-scar procedure.

This patient is an ideal candidate for a short-scar face lift. The vertical vector, as demonstrated by the examiner's hand, does not result in any folds of excess skin behind the earlobe.

This patient is not a candidate for a short-scar face lift, because the vertical vector demonstrated by the examining hand results in folding of excess skin beyond the earlobe.

1 week postoperatively

4 weeks postoperatively

This woman is shown 1 week postoperatively following a short-scar face lift. The band extending from her earlobe diagonally across the neck would have easily been avoided if the dissection had proceeded posteriorly over the sternomastoid muscle, necessitating upward extension of the incision in the postauricular sulcus. However, this band resolved spontaneously at 4 weeks.

TECHNICAL CONSIDERATIONS IN THE SHORT-SCAR FACE LIFT

The submental area and jawline may be improved simply through the short-scar technique in some patients. In others it is necessary to make a submental incision for liposuction as well as for submental contouring procedures for fat removal, platysma plication, and deep plane manipulation as indicated. If the submental approach is required, I often connect the face and neck dissection in the subcutaneous plane to allow more even redraping and redistribution of the skin.

Incisions

Depending on the length of the patient's sideburns, I select a prehairline incision or a continuous incision from the temporal area.

Table 2-1 Choosing the Best Option

	Face Lift: Incision Options		
Features	**Prehairline**	**Prehairline With Discontinuous Temporal Incision**	**Temporal Continuous With Preauricular Incision**
Sideburns			
High or short	X	X	
Low or long			X
Hairline			
Anterior: Lateral canthus to hairline distance 3 to 5 cm		X	X
Posterior: Lateral canthus to hairline distance >5 cm	X	X	
Secondary face lift	X	X	

If a prehairline incision is planned, I also make a separate temporal incision to elevate the lateral brow and to accommodate the recruitment of the midface skin through the vertical pull of the short-scar face lift. The prehairline incision is continued preauricularly and intertragally and stops right at or just behind the earlobe.

TEMPORAL DISSECTION

The incision for temporal dissection is planned over the temporalis muscle, which I mark preoperatively with the patient clenching the teeth. The incision is placed behind the hairline and over the muscle. It is made in the temporal area, with dissection continuing down to the deep temporal fascia. Over the deep temporal fascia the dissection proceeds toward the orbital rim. The sentinel vein is identified and dissection continues around the sentinel vein, releasing the periorbital septa and adhesions to allow effective lateral brow elevation and recruitment of excess facial skin.

UNDERMINING

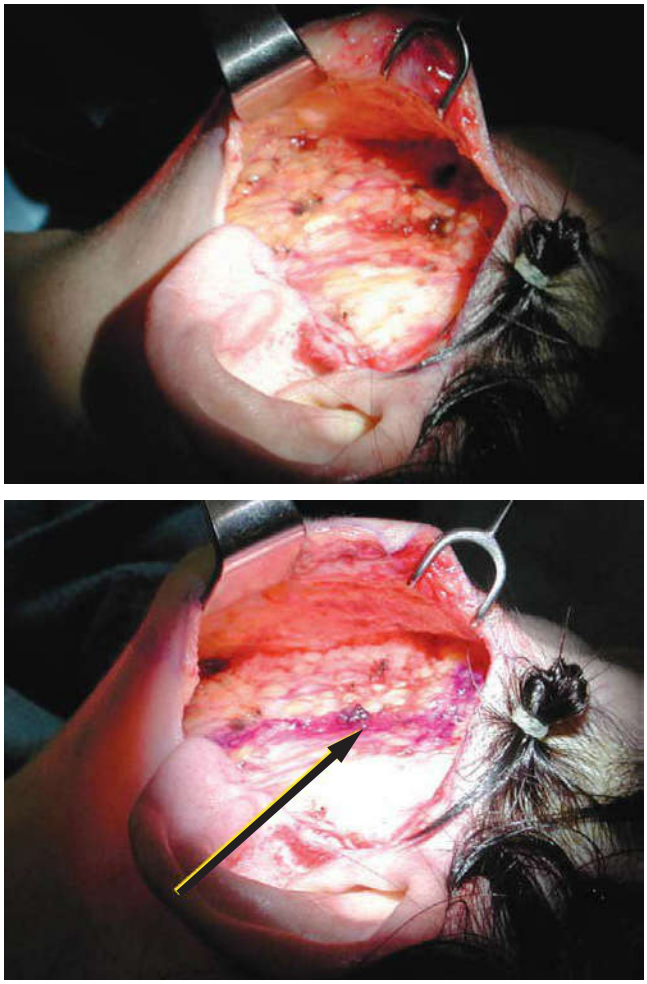
The amount of undermining is individualized for each patient. It can be fairly extensive, as indicated earlier, connecting the face and previous submental dissection, or it can be rather limited, depending on the aging changes. To prevent the development of a retroauricular dog-ear with the need for extensive dissection behind the ear, I have found that it is best to limit the lateral aspect of the neck undermining to the anterior border of the sternomastoid muscle.

Retroauricular undermining is best avoided. However, it may be necessary to dissect in the retroauricular area in some individuals to more effectively improve on the neck skin.

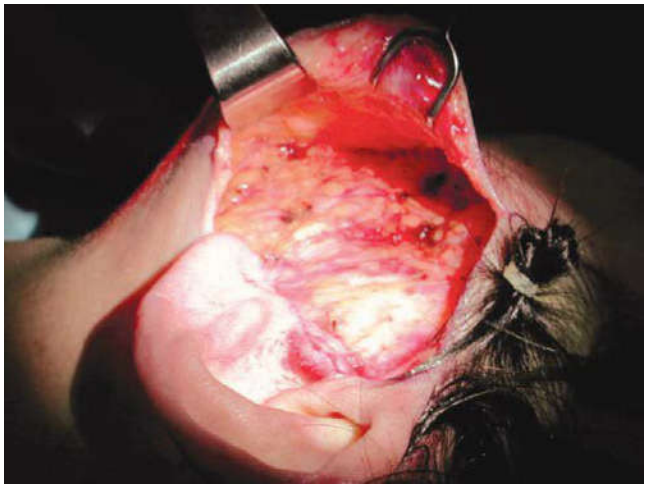
In those individuals where it is felt that neck skin would be improved by dissecting in the retroauricular area, I continue the dissection beyond the posterior border of the sternomastoid and superiorly to the level of the tragus. This dissection sometimes extends posteriorly to the occipital hairline. This dissection invariably leaves a large dog-ear that is eliminated by extending the retroauricular incision up to the level of the tragus. I have not found it necessary, however, to extend that incision in a posterior direction toward the hairline.

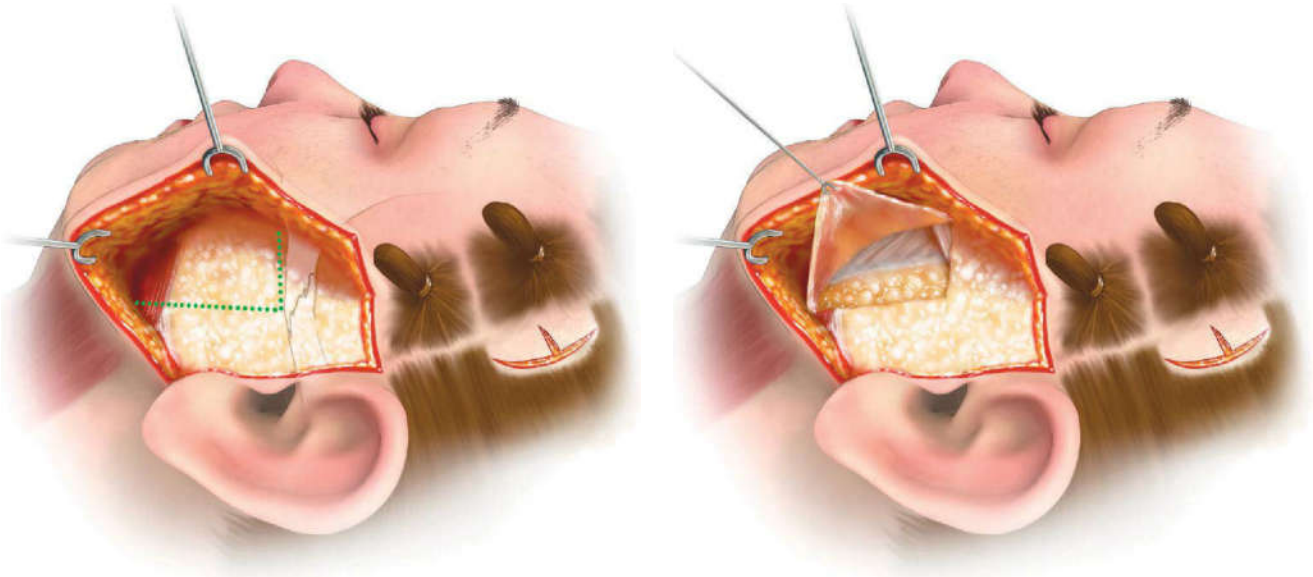
SMAS EXPOSURE AND MOBILIZATION

I prefer to incise and mobilize the SMAS, although in some patients, those with thin faces, I will plicate the SMAS. The incision is planned along the junction of the fixed and mobile SMAS.

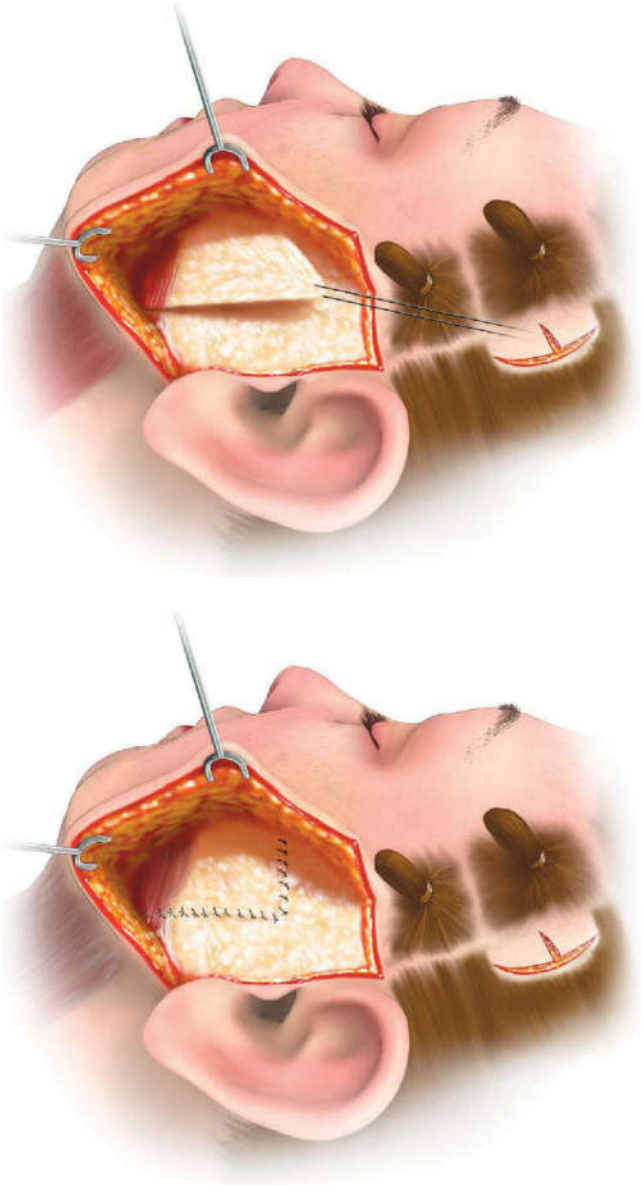


The sub-SMAS dissection is then initiated at the junction of the adherent and mobile SMAS *(arrow)*. The diagonal incision is made in the SMAS extending from the zygomatic prominence medially toward the angle of the mandible laterally. The dissection continues along the lateral border of the platysma. Sharp dissection is carried out to the anterior border of the parotid. Beyond the gland, I prefer blunt dissection to minimize the risk to the branches of the facial nerve.

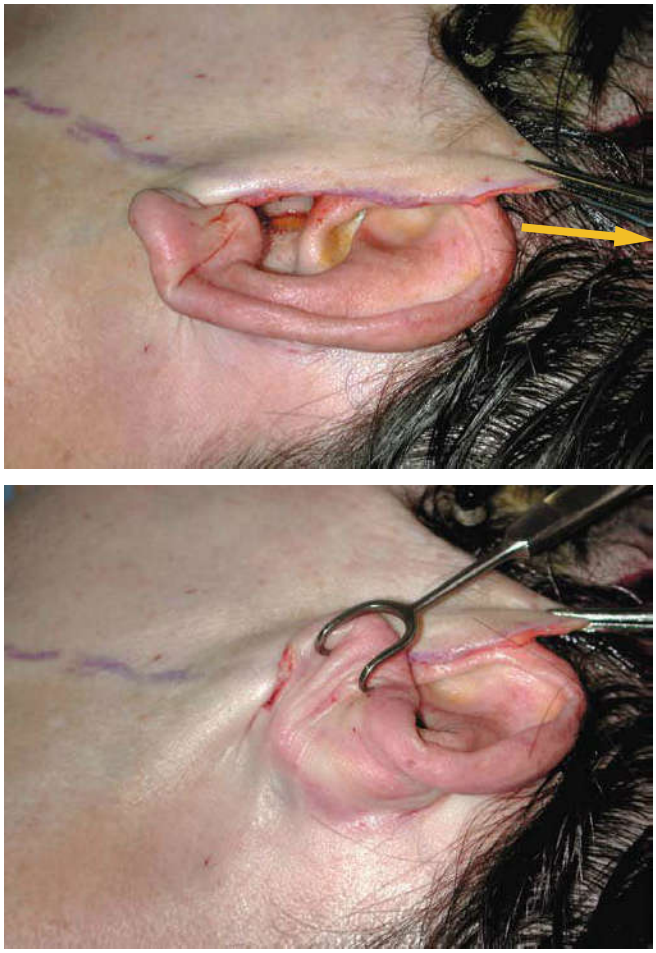




The SMAS platysma, once mobilized, is pulled upward vertically. If necessary, a portion of the elevated SMAS and platysma may be resected. Otherwise, it is plicated with permanent suture material. My preference is 3-0 Mersilene. Generally, in a thin face I preserve all of the SMAS; in a heavier face, I resect and discard the excess SMAS.

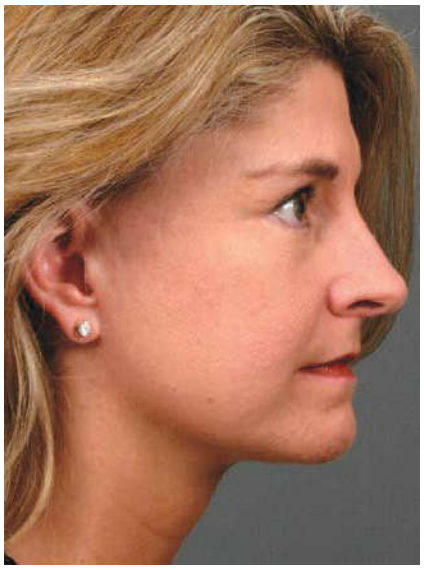


Next, the temporal fixation and closure are performed before elevation and resection of the facial skin. Sutures of 2-0 PDS are placed through the temporoparietal fascia and up into the deep temporal fascia according to preoperative vectors. This fixation will serve to elevate the lateral brow and the excess facial skin that has been recruited. A minimal amount of scalp is excised, and the temporal incision is closed with staples.



The facial skin is then pulled upward in a vertical direction. I have found that this direct vertical upward pull, together with limited dissection posteriorly at the level of the earlobe, will prevent the formation of dog-ears around the earlobe. The excess skin is resected and an anchoring suture of 3-0 PDS is placed at the base of the concha. The excess skin is then trimmed, tailored around the tragus, and inset.


I prefer a two-layer closure of 4-0 Monocryl to the dermis and running 6-0 rapid-absorbing catgut to the skin. I place a drain in all face-lift procedures. For short-scar face lifts I place a 7 mm or 10 Fr drain. The tubing is exteriorized behind the earlobe. Dressings are applied, and the patient remains overnight in our facility.

Preoperative and 4-year postoperative views are shown of this woman who underwent a short-scar face lift that included a submental incision with platysma plication.

The preoperative views of this patient demonstrate apparent excess skin in the submental area, jowls, and platysma bands on animation. She underwent a short-scar face and neck lift, including a submental incision with submental fat removal and platysma plication. The postoperative view demonstrates neck re-contouring, improvement of jowling, and no retroauricular scars.

This ideal candidate underwent a short-scar face lift through a submental incision with subplatysmal intervention, including partial excision of the submandibular gland. A lower lid blepharoplasty was also performed. The postoperative result demonstrates improvement of the submental area and jawline.

LIMITATIONS

I have found that the limitations of the short-scar face lift are not only related to skin quality and skin quantity, but also to patients who have heavy faces. Although heavy faces are difficult regardless of the approach or incisions, they are particularly challenging with short-scar techniques.

This patient is an example of the limit for me in terms of patient selection for a short-scar procedure. She has significant jowling, with some skin laxity extending perhaps beyond the thyroid cartilage. However, she demonstrated a good result at 18 months.

This patient, who would appear to be an ideal candidate for a short-scar face lift, has poor skin elasticity. This is demonstrated not only in her result, but also in the view of the retroauricular area on each side, where she has pleating that is typical as a result of poor skin elasticity. These pleats could have been avoided with a longer retroauricular scar.

Although this woman presents an acceptable result, I believe that in a patient with a heavy face and neck such as this, I would have been able to secure a better result with the full-scar face lift.

It is in the patient's best interest to focus more on the quality of the result rather than the length of the scar. Minimizing the scar while compromising the result is not in the best interest of the patient or surgeon. Unless the result meets expectations, the incision length is immaterial. As in all plastic surgery operations, careful patient evaluation is key to identifying the appropriate candidates for a short-scar procedure. For short-scar face lifts I believe the single most important factor in patient selection is evaluation of skin quality and skin excess.

COMPLICATIONS AND REOPERATION

I have seen significantly fewer hematomas with the short-scar face-lift procedures: 0.5% compared with 1% to 1.5% with a full-scar face lift. This I believe is related to less extensive dissection with these operations. I also have not had any permanent nerve paralysis.

In my early experience, dog-ears and pleats around the ear were not uncommon; some required revision. I have not had to reoperate on any of my patients to improve the result. I attribute this to careful patient selection with particular attention to the skin!

FINAL THOUGHTS

Short-scar and minimally invasive procedures for facial rejuvenation are here to stay. The demand is driven not only by media hype and exaggerated claims in advertising but most of all by patient demand. The promise of little or no scarring, minimal down time, and little or no risk is very tempting to all patients, regardless of whether they are suitable candidates. It is the difficult task and responsibility of the surgeon to explain to such patients if they are not suitable candidates for the procedure. We should know the limitations of our operations and must never shy away from informing our patients, even if we risk losing the patient to the next surgeon who may perform the procedure regardless of whether it is in the patient's best interest.

Merely reducing or eliminating a scar is not an advance or an advantage unless the results match or are superior to those of standard procedures, with similar or reduced morbidity. With appropriate patient selection, the short-scar face lift qualifies as such an advance, with definite advantages for our patients.

BIBLIOGRAPHY

Ansari P. Elimination of retroauricular incision in face lifts. Aesthetic Surg J 23:14-19, 2003.

Baker DC. Minimal incision rhytidectomy (short scar face lift) with lateral SMASectomy. Aesthetic Surg J 21:68-79, 2001.

Baker DC, Nahai F, Massiha H, Tonnard P. Short scar face lift. Aesthetic Surg J 25:607-617, 2005.

Bostwick J III, Eaves FE, Nahai F. Endoscopic Plastic Surgery. St Louis: Quality Medical Publishing, 1995.

Eaves FE, Nahai F, Bostwick J III. The endoscopic neck lift. Oper Tech Plast Reconstr Surg 23:599, 1995.

Imber G, Silich RC. Limited-incision face lift technique. Aesthetic Surg J 21:216-226, 2001.

Nahai F. Clinical decision-making in face lift and neck lift. In Nahai F, ed. The Art of Aesthetic Surgery: Principles & Techniques. St Louis: Quality Medical Publishing, 2005, p 897.

Nahai F. Neck lift. In Nahai F, ed. The Art of Aesthetic Surgery: Principles & Techniques. St Louis: Quality Medical Publishing, 2005, p 1239.

Tonnard PL, Verpaele AM. The MACS-Lift Short-Scar Rhytidectomy. St Louis: Quality Medical Publishing, 2004.

Tonnard P, Verpaele A, Monstrey S, et al. Minimal access cranial suspension lift: A modified S-lift. Plast Reconstr Surg 109:2074-2086, 2002.

Chapter

3

A Systematic Approach to MACS-Lift Operative Techniques

Joseph P. Hunstad

The outcome of facial aesthetic surgery depends on preoperative planning, operative technique, and precision. It is highly desirable for a patient to receive the benefits of facial rejuvenation without the unwanted stigmata of surgery. A dedicated aesthetic plastic surgeon will commit to performing aesthetic procedures with great care, delicacy, and precision. A properly designed procedure such as the MACS-lift allows optimal facial rejuvenation with avoidance of undesirable facial changes that indicate that surgery has been performed. Complete elimination of the postauricular scar is fundamental but was not always available with previous short-scar face-lift techniques. The impressive improvements in the midface, cheeks, and remarkably, the neck are hallmarks of this impressive technique.

Thus a revolution has occurred in facial aesthetic surgery using procedures such as the MACS-lift, where wonderful full facial and neck rejuvenation can occur with minimal morbidity and a dramatically shortened recovery period. This minimal recovery time is an essential and attractive component of the procedure. This goal can be significantly enhanced using proper infiltration techniques and fine micropoint electrocautery to truly eliminate intraoperative bleeding and, for most patients, reduce postoperative bruising.

EVOLUTION OF TECHNIQUE

Over the years ancillary procedures have been added to the MACS-lift to provide a more enhanced facial rejuvenation. Liposculpture and corset platysmaplasty are now routinely combined with MACS-lifting, and the third suture has become a routine addition for patients with midface laxity.

Because of these additions, indications for the MACS-lift have expanded. In my practice, the MACS-lift, in combination with ancillary procedures such as neck contouring, is capable of delivering excellent results to the vast majority of patients seeking facial rejuvenation. Patients with profound neck laxity occasionally require a direct neck lift during facial rejuvenation procedures, but this has become fairly unusual.

INDICATIONS/CONTRAINDICATIONS

When I began using the MACS-lift for facial rejuvenation, I believed the procedure was indicated for relatively young patients with minimal neck laxity. As experience was gained with this procedure, I realized the true power of the lifting, and began using the technique for patients with greater degrees of neck laxity and fullness, with excellent results. Patients with excess neck adiposity and laxity have remarkable results when concurrent neck liposculpture and

corset platysmaplasty are used. Central and midface malar descent is significantly improved when the third suture is incorporated. As experience was gained, the addition of this third suture was shown to add minimally to the operative time and significantly to the improvement of the central malar region.

The MACS-lift is also an excellent option for secondary face-lift patients. Patients who have had a previous face lift are amazed at how rapid the recovery is from the short-scar procedure and how impressive the results are.

Patients with severe neck laxity, in my hands, represent a continuing challenge for the MACS-lift technique. Usually these are patients who are older, with severe environmental skin damage and occasionally massive-weight-loss patients who have achieved their target weight. Other than this select group of patients, the MACS-lift has proved safe and highly effective in treating the majority of patients seeking facial rejuvenation.

OPERATIVE PROCEDURE

Key Elements

- Full facial and neck infiltration is performed, similar to the infiltration method used for liposculpture.
- Blunt-tipped infiltration cannulas are used to eliminate bleeding during infiltration. Thorough infiltration is performed with epinephrine-containing fluid that significantly expands tissue planes, magnifies these anatomic layers and makes them more distinct, and promotes profound vasoconstriction.
- Infiltration is performed in a pressurized fashion, infiltrating approximately 500 ml for the full face and neck. This pressurized fluid exsanguinates the facial tissues, allowing the epinephrine solution to become maximally effective.
- Lidocaine with epinephrine is injected using a 25-gauge needle and syringe into the dermis along the incision line. The incision can then be made with virtually no bleeding.
- The fine zigzag incision is made with a scalpel into but not completely through the dermis, perpendicular to the hair follicles. This protects the subdermal plexus so the incision line does not bleed.
- Electrocautery using a Colorado or equivalent micropoint tip is used to complete the incision through the dermis and for all subsequent dissection. This virtually eliminates bleeding throughout the procedure.

Continued

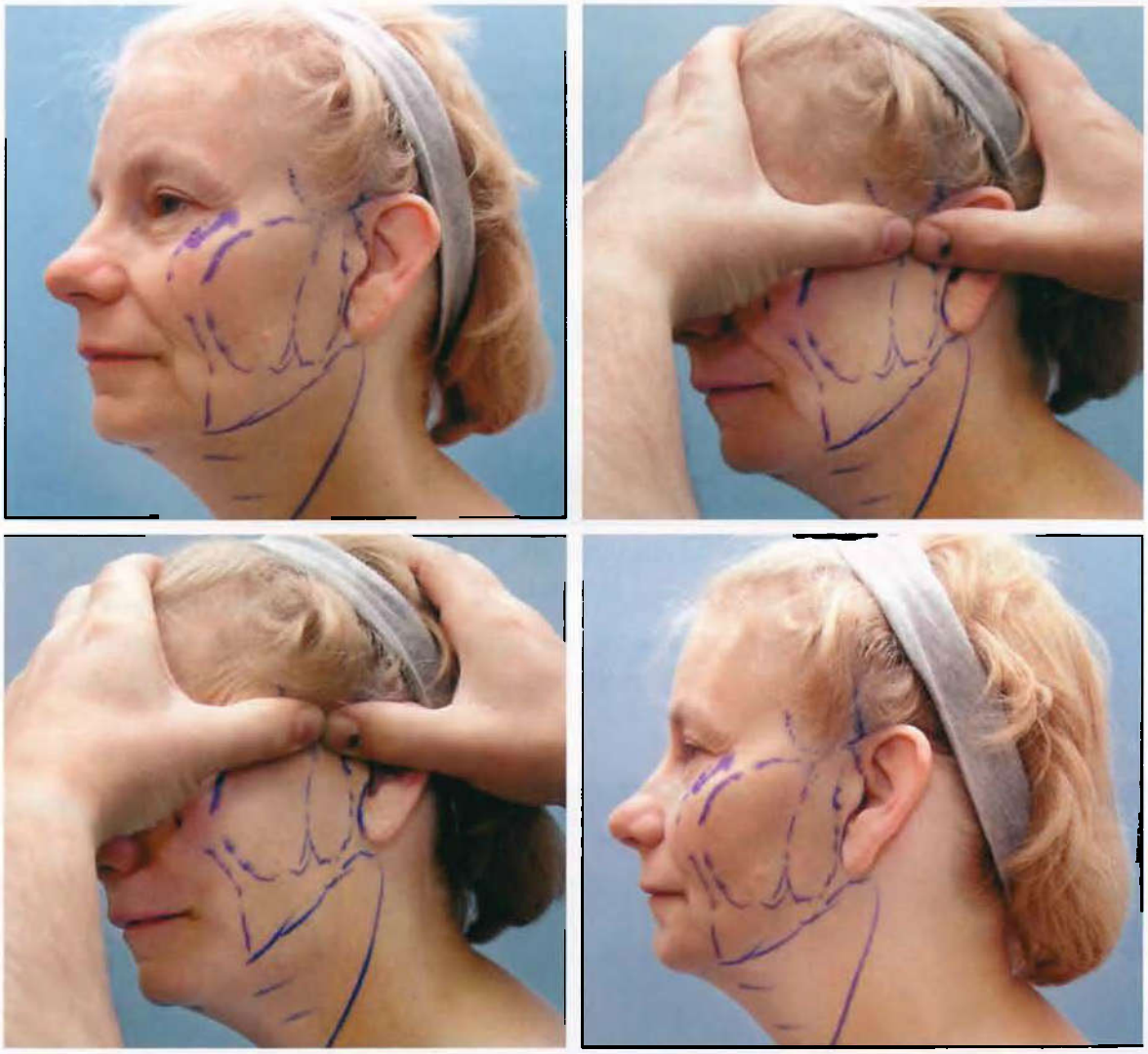
Key Elements—cont'd

- The superficial temporal vessels are identified and ligated, eliminating this potential site for postoperative bleeding.
- Dissection extends anteriorly, close to the nasolabial fold to allow the "O" suture (as described by Saylan) to be maximally effective for the improvement of this area.
- No dressings are applied for patients who remain overnight in our facility. This allows careful inspection of the surgical site by the night nursing staff. For outpatients, a light compressive dressing is applied that is removed the following day. Penrose drains are removed on postoperative day 1.
- Our anesthesia method of choice is a general anesthetic provided by our anesthesiologist. Occasionally we perform these procedures under local anesthesia with sedation, which is also highly effective. Because of the profound vasoconstriction achieved by our method of infiltration and electrocautery dissection, vasodilation secondary to general anesthesia has not had a detrimental effect on intraoperative bleeding or postoperative bruising.

Markings and Incision Placement

Patients are carefully photographed and marked preoperatively. The decision to perform a prehairline or scalp incision is made preoperatively and is discussed again with the patient before surgery. This decision is made by strongly elevating the preauricular skin at the sideburn level and noting the degree of hairline elevation achieved. If the sideburn is long and the hairline low (unusual), then the scalp incision is used. More often, however, this maneuver elevates the sideburn excessively and the prehairline incision is used. Preauricular markings are made in a retrotragal pattern. The lower edge of the jawline is outlined, as is the extent of undermining.

A point 2 cm below the lateral canthus is marked as a point of fixation and elevation for the midface using the third suture. The undermining takes this point into consideration as well as the fixation point lateral to the orbital rim for malar suspension to the deep temporal fascia.



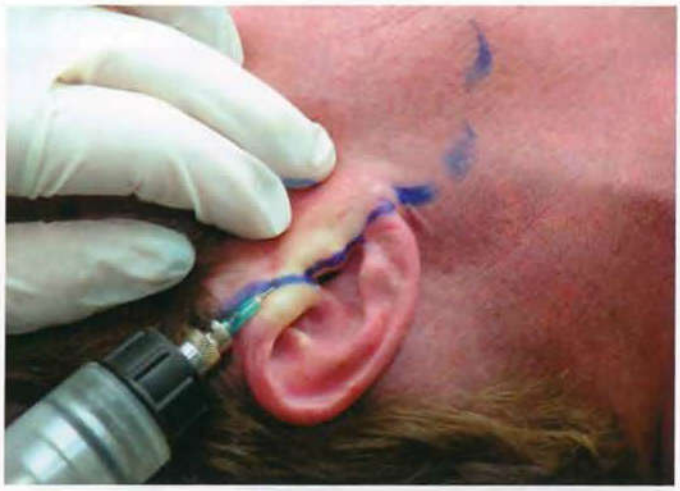
Anesthesia

Most of our patients choose general anesthesia. Local anesthesia with sedation is a reasonable alternative that some patients request. Regardless of the method chosen, once sedation or anesthesia induction has occurred, local infiltration is performed using our standard face-lift mixture.

Hunstad Face-Lift Infiltration Formula

Normal saline	500 ml
1% Lidocaine	50 ml
Epinephrine 1:1000	1 ml
Kenalog-40	1 ml
TOTAL	552 ml (enough for full face and neck infiltration)

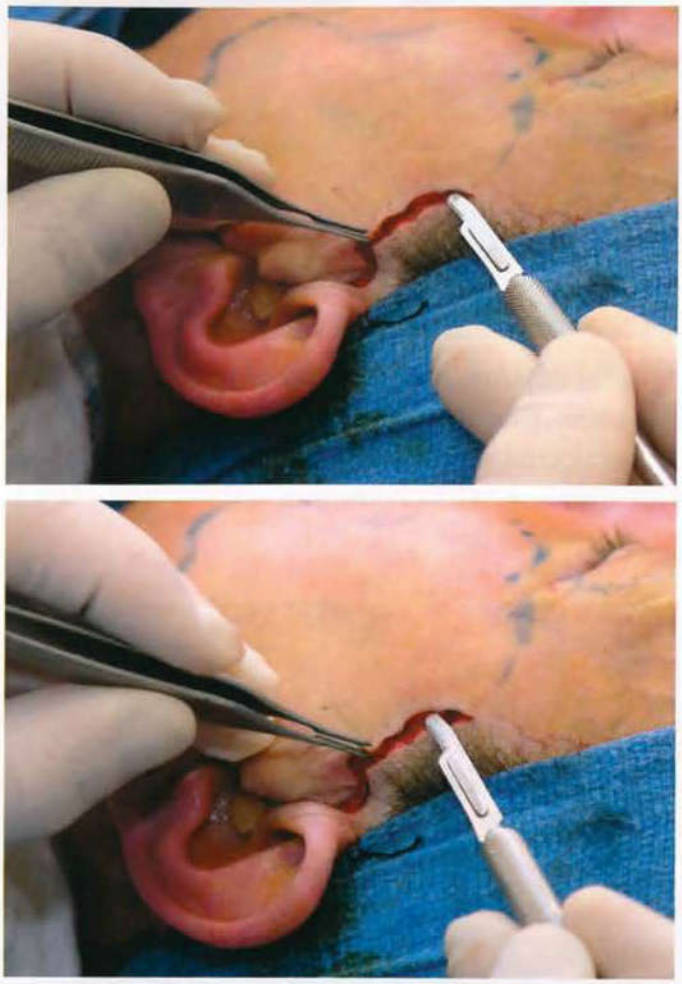
Infiltration of local anesthetic (300 to 500 ml) is very important when performing the "electric MACS-lift." Because electrocautery is used throughout the entire procedure, thorough infiltration is valuable because it creates a hydrated subcutaneous environment with distinct soft tissue planes and desirable vasoconstriction. These planes are easily visualized and allow electrocautery to be performed without difficulty. The hydrated tissue is also extremely effective by providing a cooling medium so that tissue heating does not occur. Because electrocautery provides a truly bloodless field throughout the procedure, there is virtually no bruising postoperatively—a benefit enthusiastically embraced by all patients.



The important planes of dissection over the platysma and orbicularis oculi are clearly visualized using this approach as will be demonstrated subsequently. The incision line is injected superficially, immediately below the dermis to provide profound incision line vasoconstriction.

If endotracheal intubation is performed, the endotracheal tube is secured to the canine tooth with dental floss, which does not distort soft tissue structures and is very secure. The eyes are protected with ophthalmic ointment to prevent dryness during the procedure. Careful preparation and draping are then performed, with the drapes usually secured with silk sutures to prevent displacement.

Technique

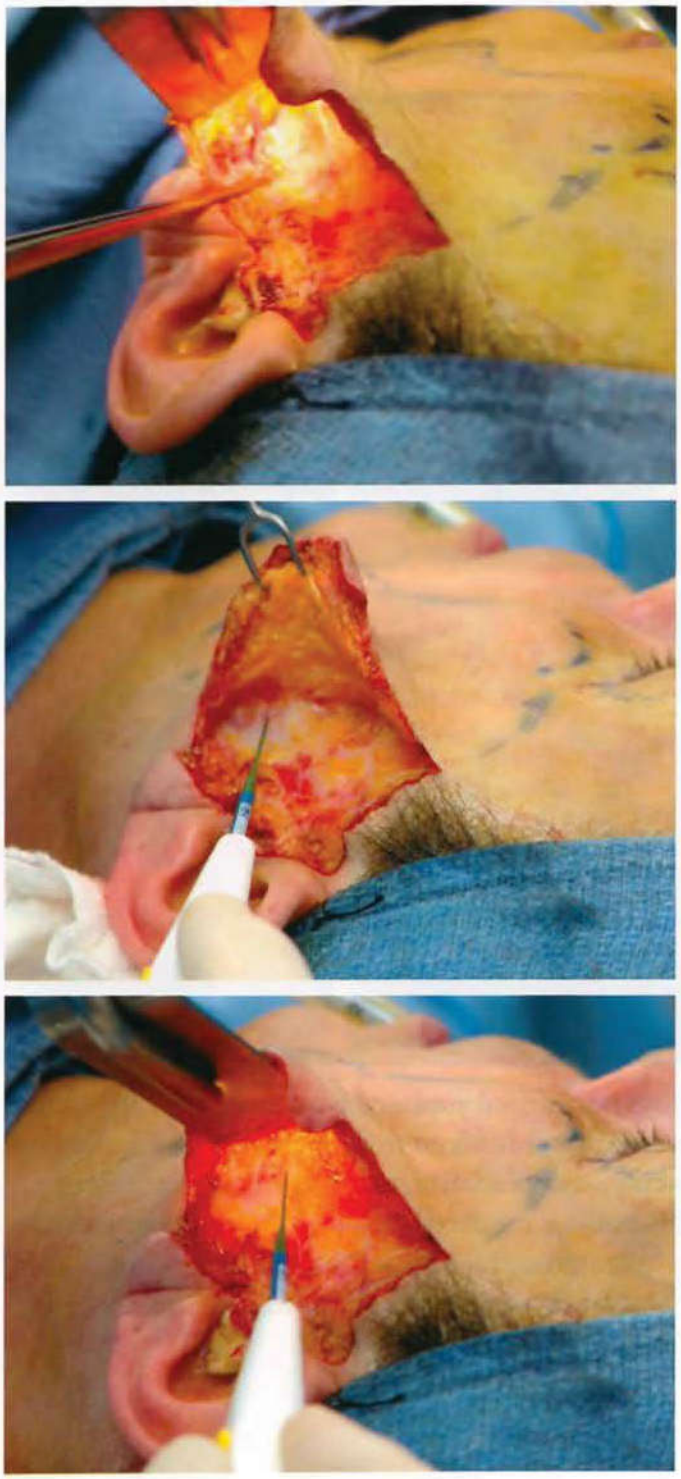


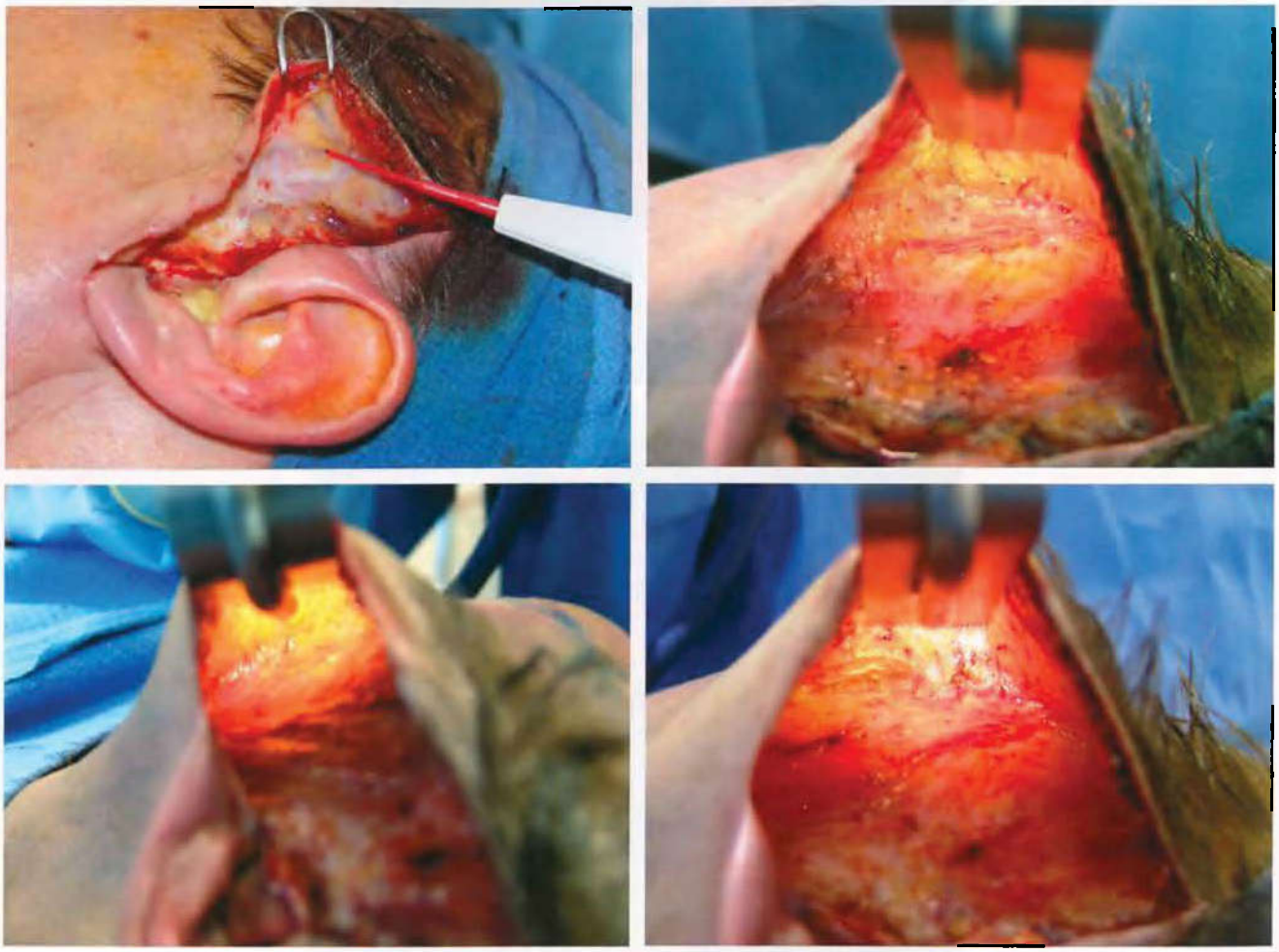
The prehairline incision is made with a No. 15 blade perpendicular to hair follicles in a tight zigzag pattern. This approach permits hair growth to occur postoperatively not only through but also in front of the incision line.

Dissection is then carried to the subcutaneous fat. The skin over the tragus is usually elevated with electrocautery if it is mobile, or with curved iris scissors if it is adherent.

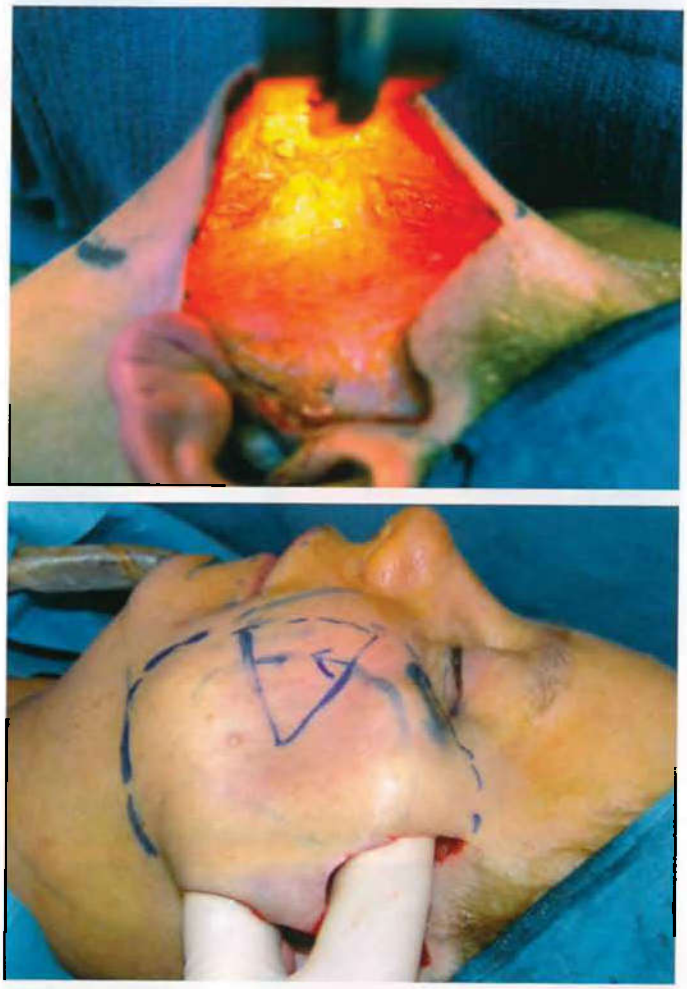
From this point forward, the entire dissection is performed using electrocautery with a Colorado micropoint tip. This fine insulated pinpoint device permits precise and delicate dissection to protect and preserve maximum flap vascularity, maintain dissection superficial to the SMAS protecting it and the facial nerves, and perform flap elevation in exactly the correct plane.

Dissection is performed inferiorly until the fascia of the platysma is identified at the angle of the mandible. To identify the critical fibrous portion of the platysma, dissection may need to be performed up to 2 cm inferior to the mandibular border. The dissection then continues anteriorly over the muscle itself along the jawline. Once the fascia and muscle are seen, the dissection is very safe, with facial planes clearly evident, magnified by the hydrated tissue plane separation resulting from infiltration. The muscle is clearly seen separated from the overlying fatty soft tissues, and dissection is performed immediately superficial to the muscle. This ensures preservation and protection of all of the soft tissue of the face as well as the accompanying blood vessels superficial to the SMAS. Thus the most vascularized and robust facial flap possible is preserved.

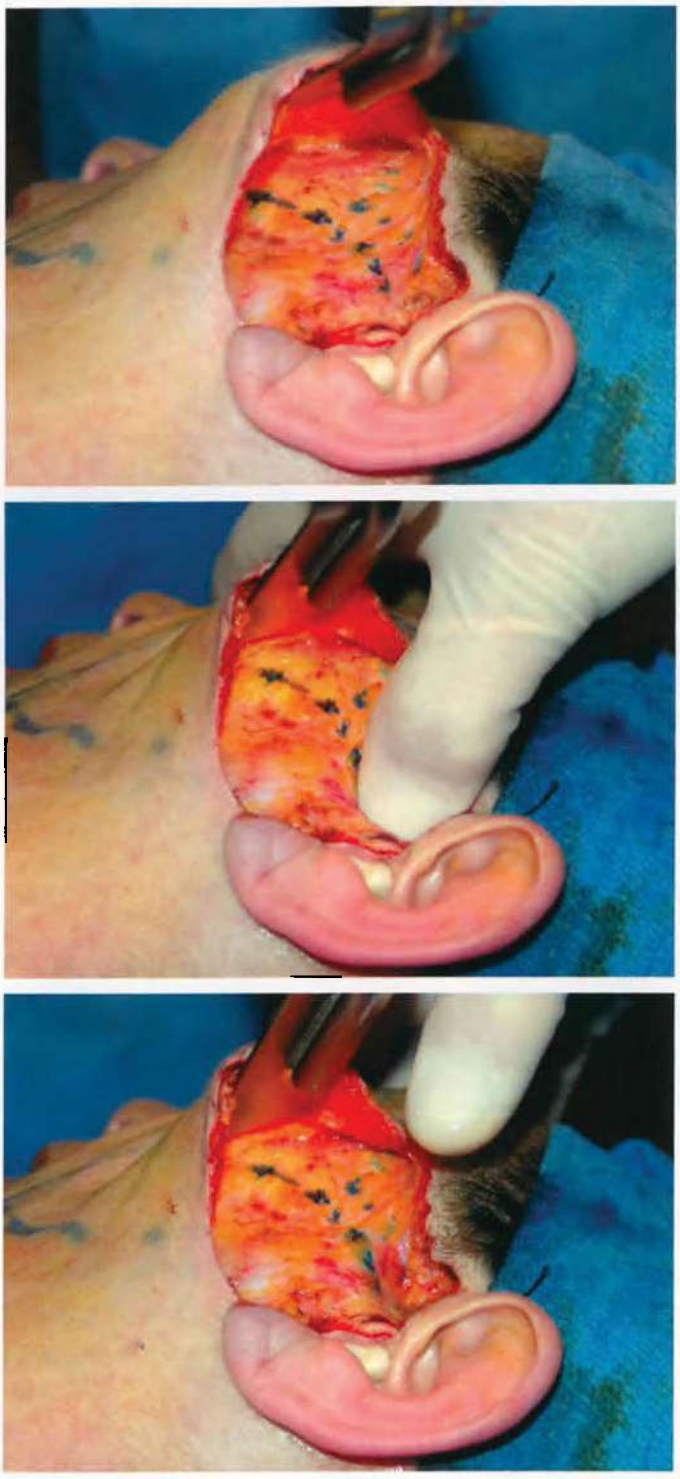




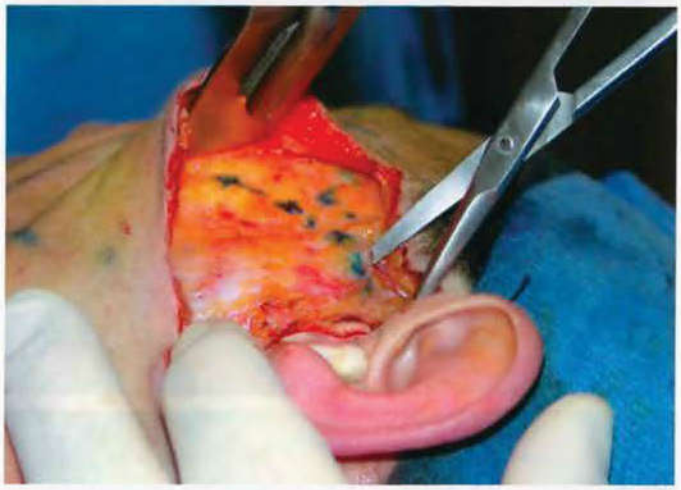
Dissection is then performed superiorly until the lateral edge of the orbicularis oculi muscle is seen. Care is taken to avoid undermining the orbicularis by dissecting too deeply; to avoid this, we recommend dissecting directly to this point. Once this point is reached, dissection over the muscle is straightforward because of the hydrated state achieved by the local anesthetic infiltration. This is a very safe plane because it is superficial to the muscle.

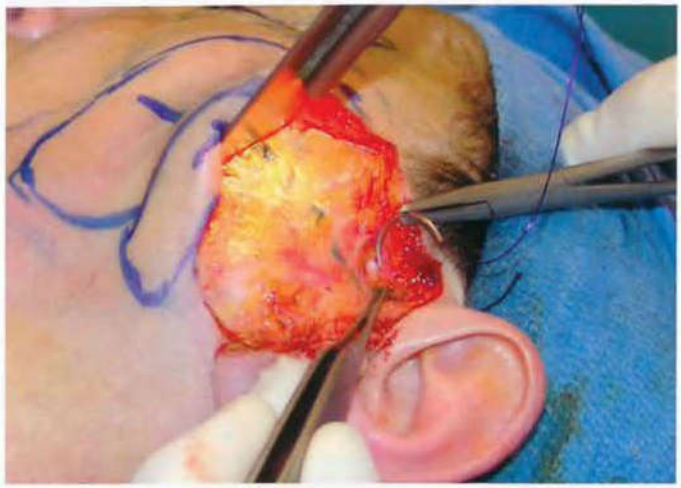


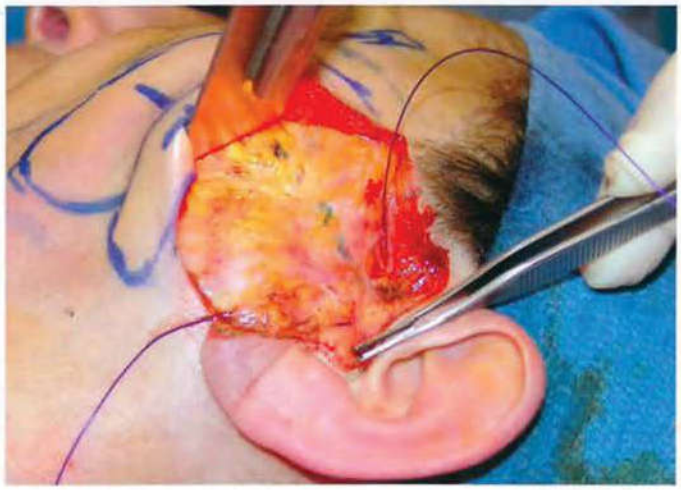
Once the full extent of the dissection over the inferior portion of the orbicularis oculi is completed and the dissection over the superior portion of the platysma has been achieved, the intervening tissue can be elevated safely at a level defined by these two points.

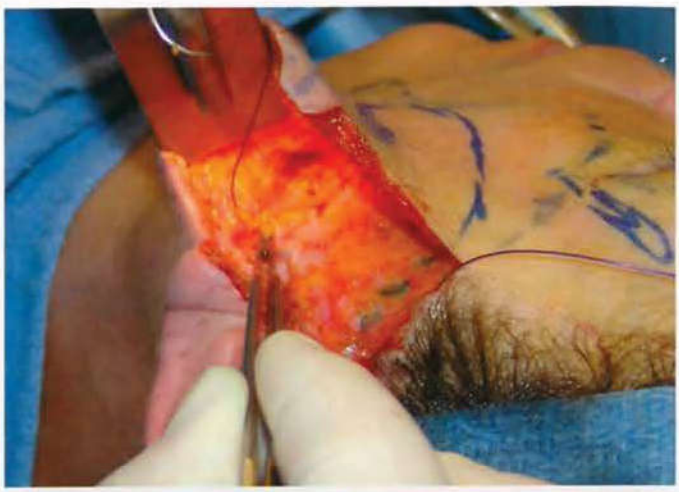


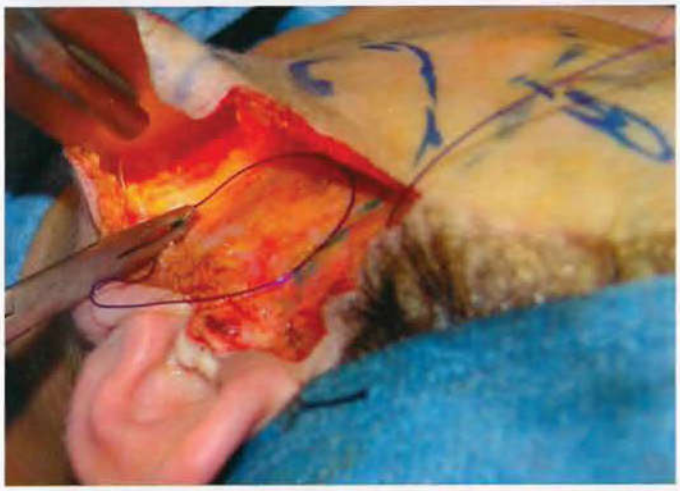
After undermining, I carefully spread the tissue 1 cm anterior to the incision, just cephalic to the zygomatic arch which is outlined with methylene blue. I compress this area with my thumb to displace the infiltration fluid so I can clearly visualize the superficial temporal vessels and accurately identify the zygomatic arch.

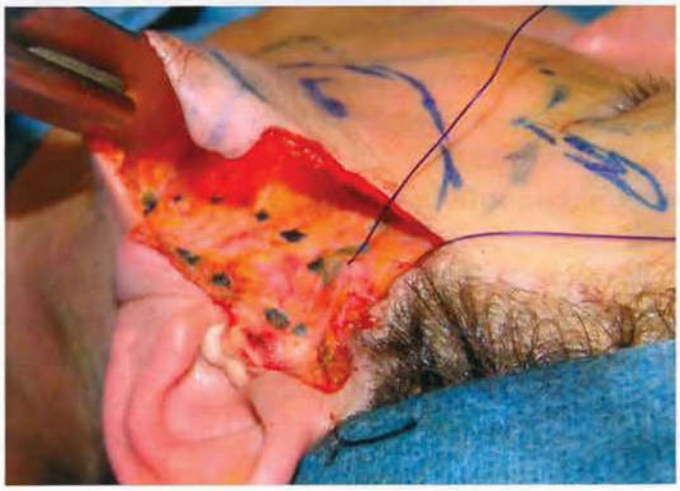


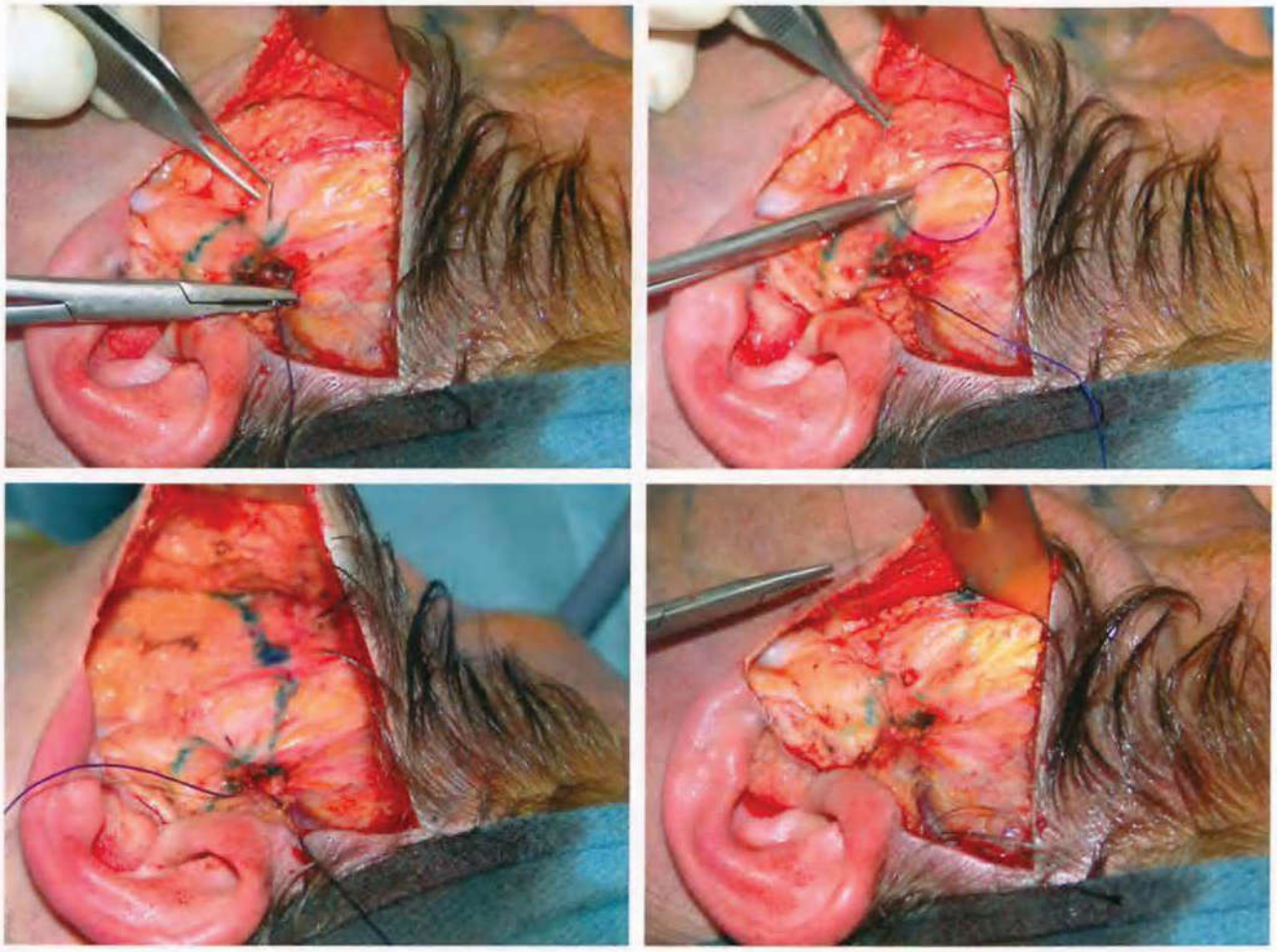


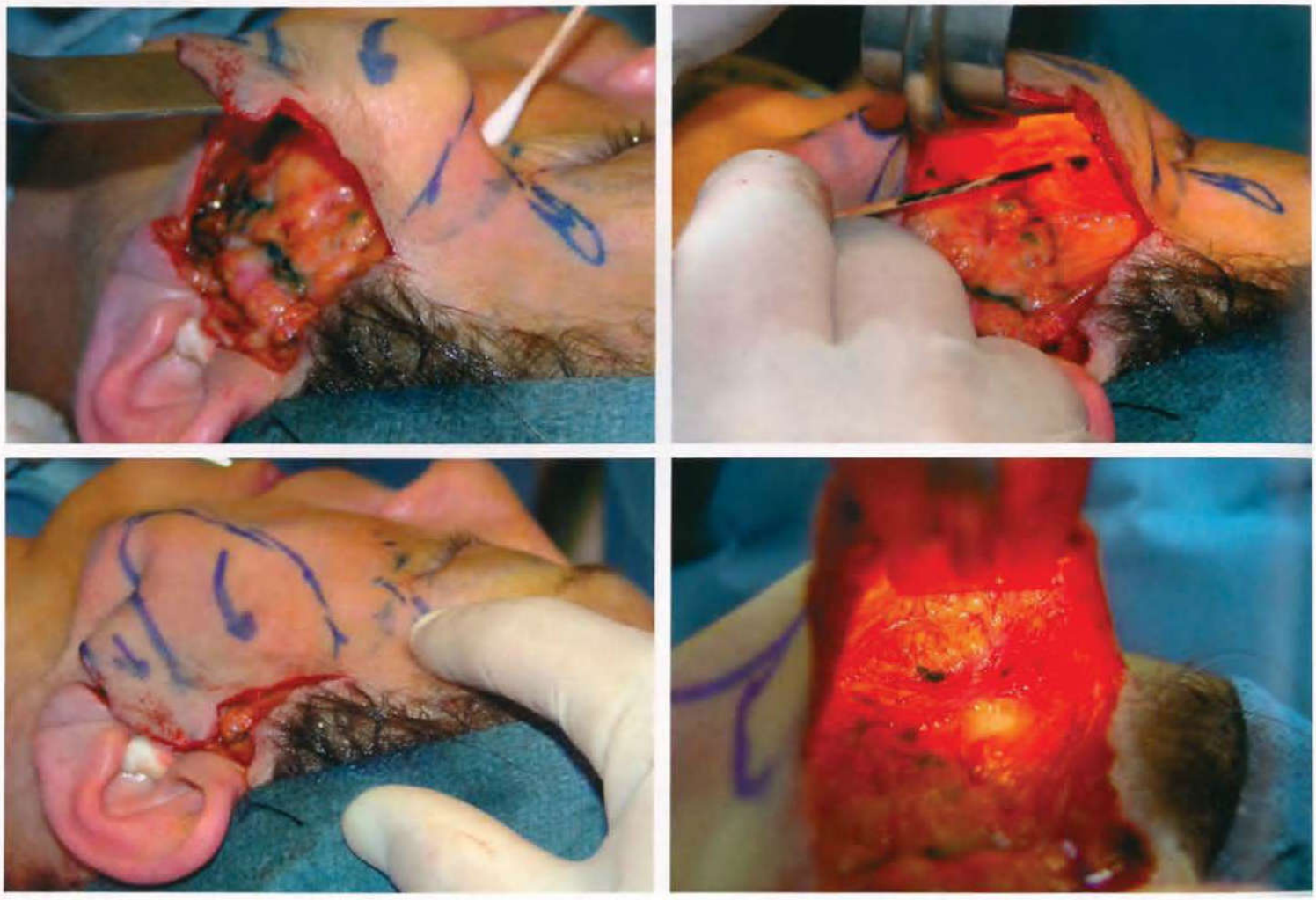


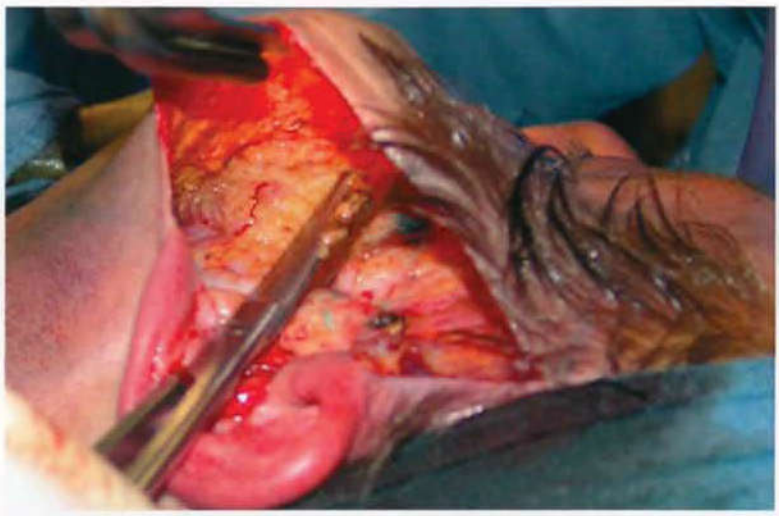


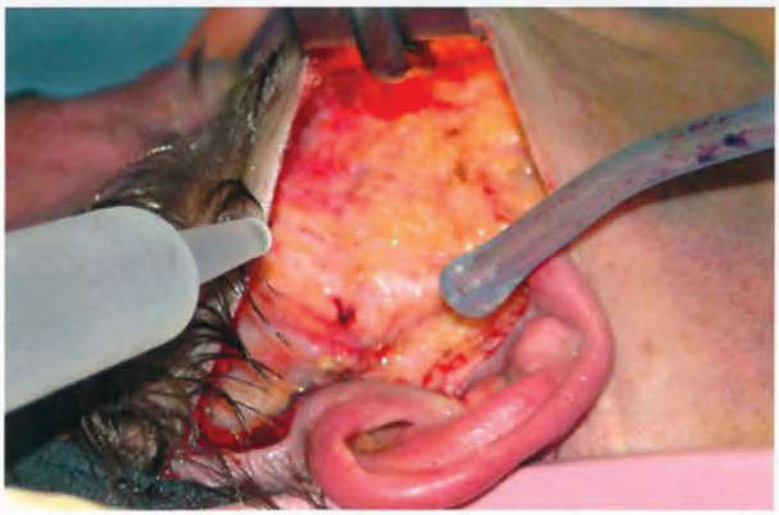


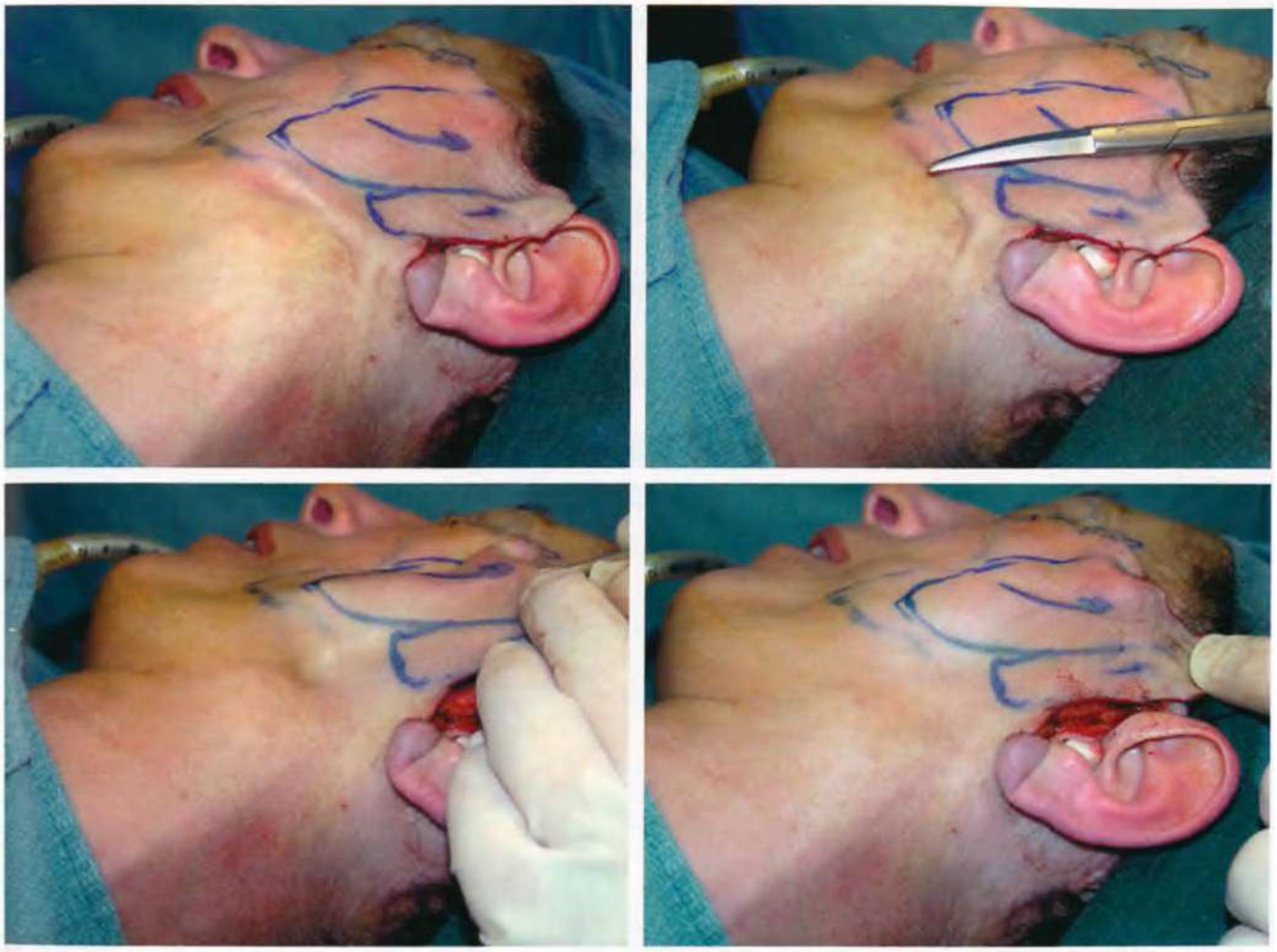


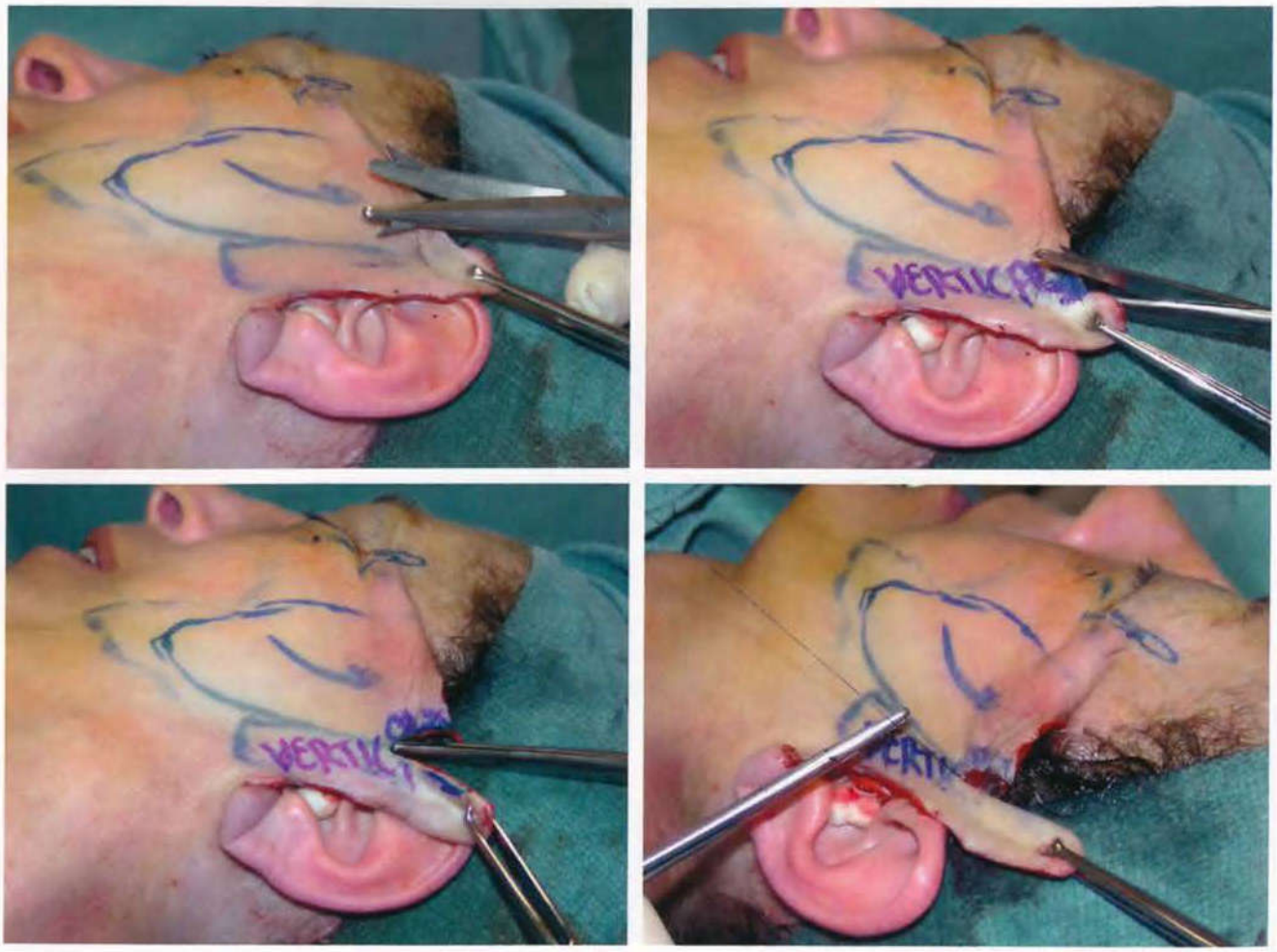


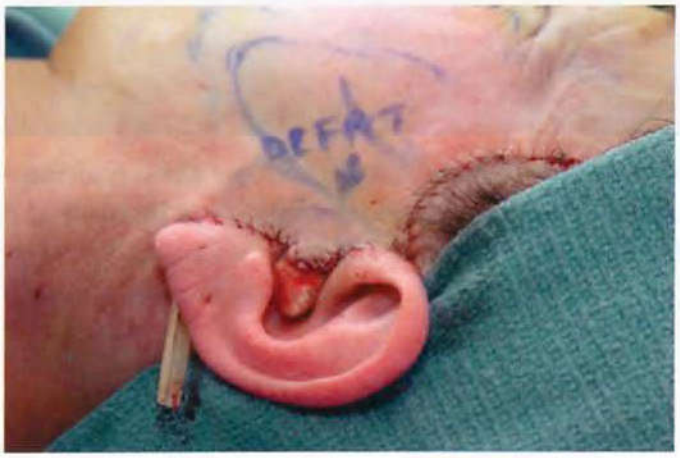


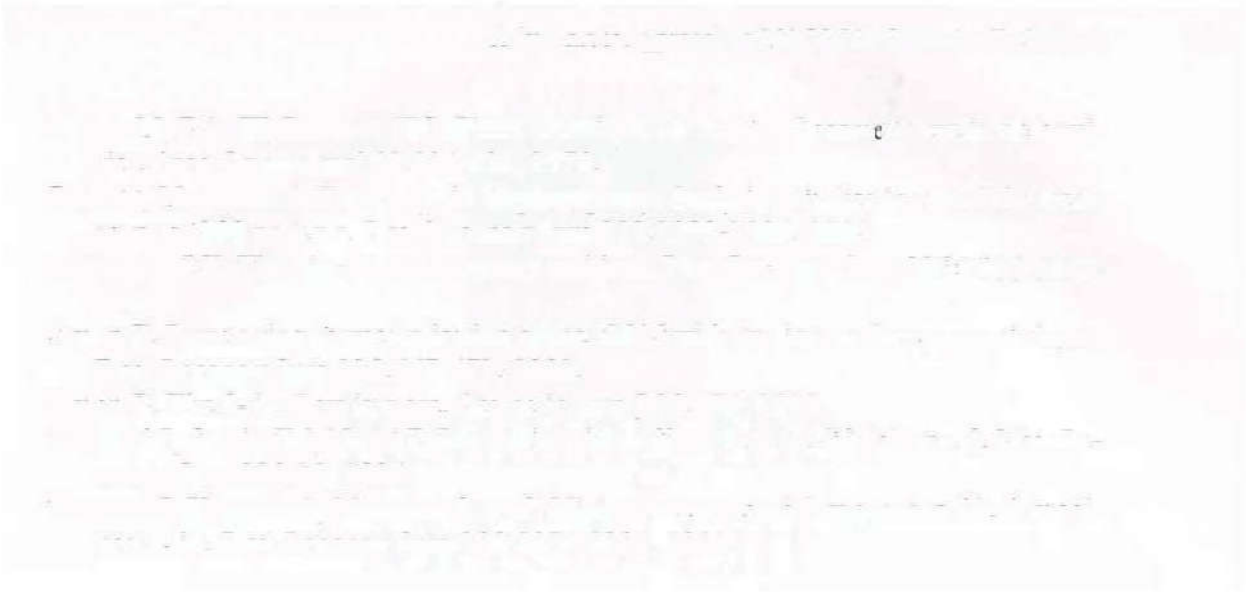












Chapter

4

Refining the MACS-Lift Technique and Defining Its Limits

Patrick L. Tonnard • Alexis M. Verpaele

When we begin using a new technique and the first results are generally positive, the temptation is very real to overuse the procedure, employing broad indications for the technique. In our early experience with the MACS-lift, we were gradually confronted with some situations in which the initial basic technique did not adequately solve the patient's problem.

In this chapter we present an overview of the obstacles we encountered and the methods that allowed us to overcome the imperfections of the early MACS-lift technique. We focus on the debate whether to open the neck or not, and how we could substantially ameliorate our results in the neck using a secure platysma suspension. We also present a detailed analysis of all the complications encountered in our series of nearly 700 cases. Minor suture-related problems encountered and the advantages and disadvantages of each suture type are addressed.

We also review the importance of the third malar suture, which in our opinion is a valuable alternative to many extended and potentially dangerous midface corrections currently available.

Many surgeons are reluctant to use the prehairline incision, and for this reason we have dedicated a section to achieving a problem-free scar in this region.

We present additional experience with the MACS-lift as a secondary lifting procedure following a traditional face lift. We examine the differences in post–face-lift aging between the traditional procedures and the vertical MACS-lift with regard to avoiding unwanted face-lift stigmata.

The chapter concludes with a section on difficult cases for which the possibilities and limitations of the MACS-lift technique are discussed.

WHETHER OR NOT TO OPEN THE NECK

One of the first appeals of the MACS-lift technique was that it seemed unnecessary to dissect the neck region to obtain a pleasing neck rejuvenation. This holds many advantages: first, it reduces operative time, which is a definite advantage in procedures performed under local anesthesia. Second, at least 4 cm of incision is eliminated with all its potential morbidity. Third, the discomfort and convalescence associated with a liposuctioned neck are significantly less than with an undermined neck flap. Fourth, and perhaps most important, the MACS-lift avoids the possible complications of opening the neck.

Hematoma

Opening the neck alone increases the risk of hematoma threefold. There is a higher risk of arterial bleeding, especially when additional digastric muscle or submandibular gland resections are involved. In conjunction with wide bilateral undermining of the cheeks, such a hemorrhage can provoke a major blood loss. Compression of the trachea can even impair intubation if this proves necessary for a revision procedure.

Seroma

The risk of seroma increases proportionally with the amount of dead space created by undermining. Drainage cannot always prevent it.

Skin Ischemia

The potential for skin ischemia is directly related to increased undermining and thinning of the skin flap. This is even more likely to occur in vascularly impaired patients and smokers.

Skeletonization and "Gunshot" Deformity

Skeletonization and gunshot deformity (submental excavation) can occur, especially in conjunction with a subplatysmal fat resection. This probably occurs as a result of a technical error caused by loosening of the platysmarrhaphy, overresection of subplatysmal fat, or the combination of both. An undercorrected neck can always be revised if the patient desires, and it never looks unnatural. An overcorrected, skeletonized neck, on the other hand, looks absolutely unnatural and is very hard if not impossible to restore.

Marginal Mandibular Branch Nerve Injuries

Marginal mandibular branch injuries can also occur after liposuction of the neck, but this is very rare and results from inadvertent subplatysmal suctioning. After extensive platysmaplasty, with or without mandibular gland resections, this complication occurs with significantly more frequency, even in the most experienced hands.

The clinical experience of 7 years of MACS-lifting has taught us that in 90% of cases a more than satisfying neck correction can be obtained by vertically suspending the laterocranial edge of the platysma in combination with liposuction, without any dissection of the overlying skin. This fact alone has signifi-

cantly reduced operating time and complications and made the procedure achievable with local anesthesia. This adds tremendously to the appeal of the MACS-lift to the public.

Nevertheless, in reviewing our slides we found that in 10% of our patients the neck was insufficiently corrected. In half of these cases (5%), there were residual vertical folds in the infralobular region, which were treated by a posterior cervicoplasty; and/or heavy platysmal bands, which needed direct excision by an anterior approach. The remaining 5% were cases in which there was a true excess of skin in the submental area, which could only be corrected by completely undermining and redraping the skin.

Case Example

Aesthetic Analysis

This 54-year-old woman requested minimally invasive facial rejuvenation. She had heavy facial features and thick seborrheic skin. She had an obvious skin excess in the submental and upper neck region, heavy jowls, and deep marionette grooves and nasolabial folds. She showed a descent of the midface with an infraorbital hollow, an upper blepharochalasis, and correct position of the eyebrows.

The procedure was done under local anesthesia with intramuscular midazolam relaxation (3 mg) and took 2 hours and 15 minutes. She was discharged 2 hours after surgery.

Surgical Plan

The treatment consisted of:

- Submental liposuction
- An extended MACS-lift
- A lower pinch blepharoplasty
- An upper blepharoplasty with fat resection of the two compartments

Postoperative Results

The patient is shown 1 year postoperatively. In the frontal view, there is an overall improvement of the facial shape from a rather square to an oval shape. In the oblique view, she shows better definition of the mandibular border, correction of the marionette and nasolabial grooves with a better volume in the midface, correction of the infraorbital hollow, and blending of the lid-cheek junction. The effect of the upper blepharoplasty is obvious.

What is striking in the profile view is the definite undercorrection of the cervicomental angle because of a true skin excess. This can be corrected only by complete undermining of the neck skin. This was proposed to the patient, but she refused; she was happy with the results and unwilling to undergo further surgery.

Perhaps a slight overuse of the technique through our enthusiasm has allowed us to filter out the true limits of a technique without undermining the neck skin.

Opening every neck means overtreatment in many cases. Never opening a neck is undertreatment in a limited amount of cases. Our current approach is still to avoid opening the neck whenever possible. This conservative approach is certainly a safe one and will deliver a satisfying result in a maximum number of cases.

THE NEED FOR SECURE PLATYSMA SUSPENSION

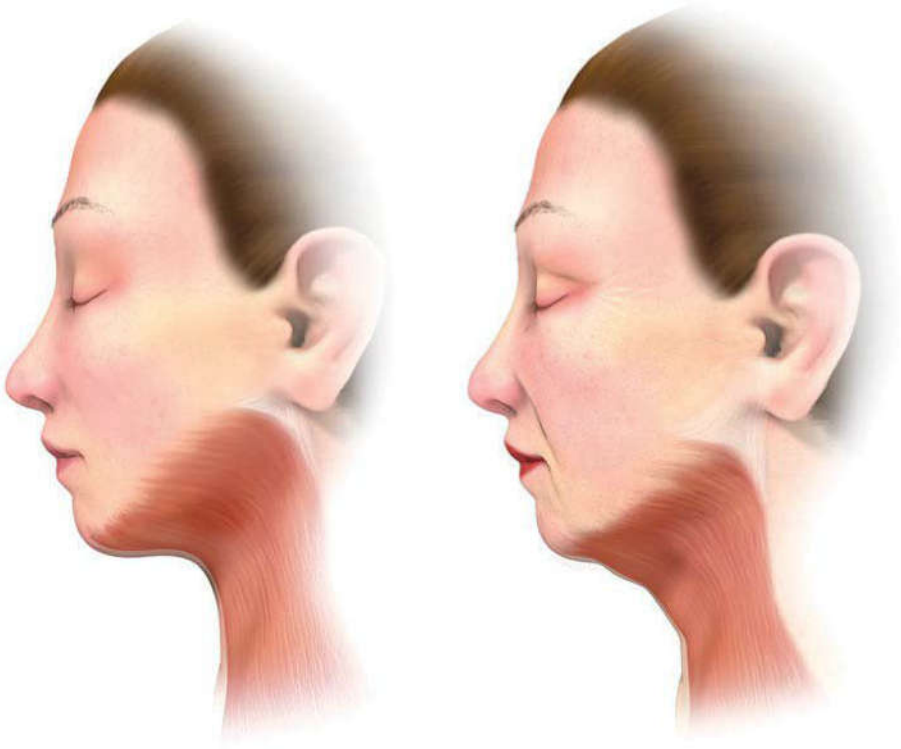
A few patients of the early series show an early relapse of submental laxity. In the first description of the MACS-lift, the lower limit of the skin undermining was arbitrarily determined by the mandibular angle. The work of Daniel Labbé (see Chapter 7) has made us understand that the key to a stable cervicomental angle is a strong and secure suspension of the laterocranial edge of the platysma muscle. Dr. Labbé obtains his cervical suspension by suturing the cranial platysmal edge to the ligament of Loré, a very strong structure at the base of the earlobe. This is exactly the same principle of the vertical suspension suture as in the MACS-lift, but with a different anchor point.

To effectively suspend the platysma, dissection at the mandibular angle should be carried as far down as necessary to obtain a clear view of the platysmal fibers. In some patients the platysmal edge is lower than the mandibular angle and a dissection to 2 cm below the mandibular angle will be necessary to expose the platysma muscle. Thus in contrast to what was described in the earliest publications, the lower limit of the skin dissection is not always the mandibular angle, but the level at which the edge of the platysma is seen.

The first vertical suspension loop requires a minimum of two strong bites in the platysma muscle before reversing the direction of the suture.

Tying this suture will transmit the tension to the submental area and suspend the cervical region. Failure to provide a secure grip on the platysma will result in an early release of tension. This explains the relapse in submental laxity in some of our early patients.

In this cranioposterior view of the patient's left side, a strong bite is being taken in the craniolateral platysmal edge.



Platysmal descent results from attenuation of the ligament of Furnas. In youth *(left)*, the platysma edge is high and close to the earlobe. In the elderly *(right)*, the platysma has descended causing an attenuation of the cervicomental angle. To reposition the platysma in its youthful location, a more caudal undermining is required to grasp the laterocaudal edge of the platysma.

COMPLICATIONS

The incidence and nature of complications has largely remained the same over 7 years of experience with the MACS-lift. We have now treated over 600 patients and the odds of encountering new complications have increased.

We had only one major complication—a severe 4 by 4 cm full-thickness skin slough of the cheek in a patient undergoing MACS-lift as a secondary face lift. The patient was a heavy smoker who refused to quit smoking despite our explicit instructions. Formerly we did not consider smoking to be an absolute contraindication for MACS-lifting in view of the limited undermining and short cheek skin flaps. It has become increasingly clear, however, that smoking is at least detrimental to wound healing and can impede healing in cases of marginal vascularity of the skin. Currently, we consider smoking to be a relative contraindication and we still strongly advise the candidates for MACS-lifting to stop smoking beginning 2 weeks before until 2 weeks after surgery.

In our practice, the overall incidence of minor complications (without permanent damage) is currently 5%. Zero percent would be ideal, but surgery without any complications simply does not exist. According to Daniel Baker, "Any complication incidence over 5% should make one reconsider one's surgical technique."

The hematoma incidence went down from 2% in our first series of 250 patients (see Volume I, p. 273) to the present 0.9% (six cases) in a population of 637 patients. The last hematoma in this series occurred more than 2 years ago. This decreased incidence is the result of 7 years of surgical experience.

Table 4-1 Results November 1999–November 2006 (N = 637)

Complication	Number	Percentage
Major (skin slough)	**1**	**0.2**
Minor	**32**	**5.0**
Hematoma (none last 24 months)	6	0.9
Neuropraxis (<2 months)	3	0.5
Frontal branch (1)		
Buccal branch (1)		
Marginal mandibular branch (1)		
Wound problems (requiring surgical revision)	7	1.1
Prolonged swelling (>4 weeks)	4	0.6
Infected sutures (Mersilene)	2	0.3
Palpable knots	9	1.4
Parotid fistula	1	0.2

Neuropraxis (0.5%)

In the first volume, we described a case of a frontal branch paralysis caused by entrapment of the nerve in the third suture, which originally crossed the zygomatic arch (see Volume I, p. 274). Since then we have changed the course of the third purse-string suture and have had no more frontal branch problems. Nevertheless, we encountered two more temporary nerve pareses, which resolved spontaneously within 8 weeks.

One patient showed a one-sided weakness of the upper lip, which was only visible on forced smiling and pursing of the lips. Speech and the rested facial expression were not influenced. The motion returned in 8 weeks with no residual weakness. This problem was most likely caused by one bite of the second purse-string suture being taken too deeply in the most medial part of its course where the nerve is more superficial, causing an entrapment of one of the buccal branches.

A third nerve lesion consisted of a marginal mandibular branch paresis, which also resolved after less than 2 months. It is very unlikely that it was caused by a purse-string suture entrapment, because the position of this nerve is not in the course of the MACS-lift sutures. This complication was likely the result of misdirection of the liposuction cannula under the platysma. We have also encountered this problem with isolated submental liposuctions.

Wound Problems Requiring Surgical Revision (1.1%)

The skin incision at the temporal hairline is not considered an option by many surgeons. Vertical redraping of the skin in a MACS-lift requires using a prehairline incision to avoid unacceptable raising of the temporal hairline and leaving a typical face-lift stigma. If executed properly according to our (see Volume I, p. 48) and others' recommendations (Connell and Camirand), the quality of the scar is not disappointing. This technique and the results are illustrated throughout this volume—all postoperative pictures were taken with the hair combed behind the ear so that the scar could be well observed. In only seven cases in our series did the scar have a tendency to spread. This was typically seen in patients with thick, oily, sebaceous skin, and mostly on both sides. Surgical revision under local anesthesia 6 months after surgery solved the problem. Now we can warn patients with this type of skin beforehand, and offer them a simple solution if necessary.

Prolonged Swelling—Longer Than 4 Weeks (0.6%)

One reason for the popularity of the MACS-lift technique is the quicker recovery that follows a less invasive dissection. We tell our patients that 2 to 3 weeks of social inactivity is normal after an extended MACS-lift. However, for reasons unknown to us, a few patients developed a stubborn and prolonged facial edema, in one case lasting up to 17 weeks.

This patient is shown 8 weeks, 12 weeks, and 6 months postoperatively. She reported complete recovery of the swelling after 16 weeks. In these patients all obvious causes such as vigorous facial massaging, heavy exercise, and endocrine pathology were excluded. Fortunately, the final outcome was good in all of these cases.

Preoperative

8 weeks postoperatively

12 weeks postoperatively

6 months postoperatively

Infected Sutures (0.3%)

A granulomatous infection along the course of the purse-string suture was seen in two cases in which Mersilene was used. The infection resolved after removal of the whole suture, without affecting the correction. For this reason, we stopped using this suture material (see p. 129).

Palpable Knots (1.4%)

Palpable knots occurred initially with Prolene sutures, especially in thin-skinned patients. In some cases these were even painful when the overlying skin was touched or when sleeping on that side. The suture had to be removed to solve this problem. No deterioration of the lifting effect in the face was noted. This problem still occurs occasionally, but because we are using resorbable PDS sutures, we can reassure our patients that this will disappear spontaneously after a few months.

Parotid Fistula (0.2%)

This rare but remarkable complication occurred in a 63-year-old woman who had had a face lift 6 years before. She presented with recurrent neck laxity, jowling, nasolabial and marionette grooves, lateral brow ptosis, upper lip ptosis, and perioral rhytids.

She underwent an extended MACS-lift with submental liposuction, a temporal brow lift, a pinch lower blepharoplasty, a lip lift, and a perioral erbium:YAG laser resurfacing under a local anesthesia with intramuscular midazolam sedation. The first postoperative day the dressing was removed, and no problem was encountered.

6 days postoperatively

12 days postoperatively

On postoperative day 6, at the time of suture removal, she presented with a fluctuant swelling of the right cheek, which was clinically diagnosed as a late hematoma. Needle aspiration produced 20 ml of serosanguineous fluid. Because of a slight inflammatory aspect of the skin flap, she was started on an oral amoxicillin–clavulanic acid regimen of 500 mg every 6 hours. The next day she presented with a recurrent swelling and 15 ml was aspirated.

On postoperative day 12, the swelling recurred. This time 30 ml of *clear* fluid was aspirated after the patient reported a sudden onset of the swelling during a meal. Suspecting a parotid leak, we requested that the amylase level in the fluid be measured. Twenty-four hours later the analysis indeed revealed an amylase level of 445,000 IU/L—the hallmark of a parotid leak. The patient was called back to the office for treatment with botulinum toxin, which acts on acetylcholine receptors of the exocrine acini of the salivary glands to block the secretion. Forty-two milliliters of parotid fluid was aspirated. A grid was drawn over the parotid region, dividing it into squares of 1 cm^2. Every intersection was injected with the equivalent of 0.5 units of Botox. The next day 45 ml of fluid was aspirated. On postoperative day 16 (3 days after botulinum toxin injection) the volume of aspirate had diminished to 20 ml.

9 days after treatment with botulinum toxin

8 months postoperatively

Nine days after the botulinum toxin was injected, there was no more fluid to aspirate. The rest of the postoperative course was uneventful, and a satisfying result was obtained.

The 8-month postoperative result is shown, demonstrating a good correction of the neck down to the cricoid cartilage, correction of the jowls, a replenished midface, a shortened upper lip with exposure of the upper vermilion, and effacement of the perioral wrinkles.

In meetings the question is often asked whether the MACS-lift presents a higher risk for parotid gland leak. The incidence of less than 0.2% shows that the risk is not higher than with a classical SMAS flap dissection in which the parotid gland can be injured as well. This rare complication is unlikely without preexisting factors, because most ablative parotid surgery heals without any leak or fistula formation. In this case, the patient reported a habitual "tension" in the parotid region before and while eating citrus fruits, raising the suspicion of a preexisting stenosis of Stenon's duct. Sialography performed 2 months after this event could not, however, confirm this hypothesis.

THE CHOICE OF SUTURES

A common misconception is to think that sutures alone can permanently correct soft tissue ptosis. Sutures placed under tension in living tissue always cause a degree of pressure necrosis at the ends of the loop, and therefore eventually slip through the tissues. For this reason, any technique relying purely on deep tissue sutures, whether barbed or not, placed by puncture without dissecting or moving any tissue planes is doomed to be temporary at best.

Many subcutaneous sculpturing techniques are used including imbrication, plication, rrhaphy, and purse-string sutures. The efficiency of these techniques is attributable to the following principle: when subcutaneous tissues are rearranged, they heal together with a degree of fibrosis. Skin redraping and resection carried out in the same direction as the deep tissue lifting (that is, vertical) stabilize the sculptured subcutaneous tissues and a long-lasting correction can be expected. If the vector of skin redraping is perpendicular to (that is, horizontal) the subcutaneous sculpturing, the lifting will not be supported. By the time the subcutaneous sutures lose their strength, the overlying skin will stretch vertically downward. This explains why many suturing techniques had a bad reputation—the skin redraping and resection were not vertical, but rather oblique or horizontal.

Either permanent or resorbable suture can be used. The correction is stabilized by tissue healing and not by suture strength. This was clinically evident as we switched from permanent to resorbable sutures. Initially, only Prolene and Mersilene sutures were used. Prolene had the disadvantage of being very stiff, sometimes leading to palpable and even painful knots at one of the anchor points.

Mersilene was used to solve this problem, but after two cases of granuloma formation on the suture a few months after surgery, we abandoned this suture as well. One patient is shown at *left*. Note the inflammatory aspect of the overlying skin with a tendency to abscess formation, necessitating removal of the Mersilene suture.

Removing bothersome sutures after a few months apparently did not influence the facial correction. This made us think differently about the role of the sutures, and we started using slowly resorbable PDS sutures. After using this suture for 3 years, we are confident about the stability of the result, and if a palpable knot appears in a patient, we can reassure her or him that this problem will resolve spontaneously within 3 months.

A scar reaches its maximum strength after 8 weeks. PDS retains its strength for approximately 3 months. This creates sufficient time for the prehairline scar to heal without tension so that a thin scar of good quality can form.

SIMPLE AND SAFE MIDFACE LIFT

The midface is a difficult region to treat, mainly because of the risk of causing lower eyelid distortion. Nevertheless, including it in any facial rejuvenation plan is essential to obtain a harmonious result. During the last decades, several techniques have been described to produce a rejuvenating effect on the midface. Most of them use deep plane or supraperiosteal or subperiosteal dissection to mobilize the soft tissues of the face. Although remarkable results have been described, these techniques are not free from serious complications such as facial nerve damage and ectropion, and often show significant downtime because of prolonged edema. By using suspension sutures in the very superficial level, a better cantilever is available to redistribute facial soft tissue volumes. The malar fat pad and the temporalis muscle fascia are sturdy structures to reliably anchor sutures to. Using the malar fat pad as a vehicle for lifting, midface correction with purse-string sutures appears to be effective.

We were extremely enthusiastic about the use of vertical suspension of facial soft tissues of the lower third of the face; therefore it was a logical step to use the same surgical principle in the midface. It fit perfectly in our hypothesis that the only rejuvenating vector in the face is the vertical one, and that any horizontal vector on deep tissues or skin merely produces flattening of the face without contributing to its rejuvenation. Vertical lifting of the region of the malar fat pad can be simulated in front of the mirror and softens the nasolabial fold, replenishes the infraorbital region with disappearance of a marked lower eyelid–cheek junction, and reduces the vertical height of the lower eyelid. As the anchor point for the third purse-string suture, we chose a location as ver-

tical as possible above the malar fat pad. The deep temporal fascia just lateral to the lateral orbital rim, in front of the frontal branch of the facial nerve appears to be a solid and safe anchor point for this purpose (see Volume I, p. 41).

The suture is usually tied under maximal tension because overcorrection is impossible: the malar mound cannot be moved into a nonanatomic position if it is not released from its underlying attachments. This is in contrast to subperiosteal or supraperiosteal midface lifting techniques, which allow complete relocation of facial volumes.

The decision to perform a simple or extended MACS-lift and to use two or three purse-string sutures has to be based on the need for midfacial rejuvenation.

Initially, we thought that the third suture was indicated more in older patients, but we gradually realized the benefit even in younger patients. Therefore whether to add a third suture has to be evaluated in each case. However, it is important to appreciate that this third suture will always produce skin excess in the lower eyelid that requires a simple skin excision via a lower blepharoplasty incision. Often 5 mm, and sometimes up to 10 mm, of skin can safely be removed, especially in the paracanthal region, without any risk of ectropion or scleral show, because of the strong support of the lower eyelid by the suspended malar fat pad. This malar suspension will also push the bulging fat of the median and lateral compartment of the baggy lower eyelid back into the orbit, reducing the need for any additional fat resection in these compartments.

Talking to colleagues who are using the MACS-lift technique, we noticed a certain reluctance to use the malar suspension suture and perform an extended MACS-lift. It is possible that this suture is technically slightly more difficult to place, but it is definitely worth the effort (see Volume I, pp. 122-127). It is our strong conviction that using this third suture is one of the most powerful features of MACS-lifting because it provides a very simple and safe means of midface rejuvenation. The central facial triangle, with the midface and eyelids, is the true eye-catcher, and its correction is essential to achieve a rejuvenating effect. This might even be more important than creating a perfect 90-degree cervicomental angle.

Case Examples

Aesthetic Analysis

This 55-year-old woman presented for facial rejuvenation. She showed mild neck skin laxity with moderate jowling and marionette grooves, moderate nasolabial folds, and nice facial architecture with prominent zygomatic bones. Most striking was the loose skin in her lower eyelids, with large vertical eyelid height and a marked nasojugal groove extending into a marked eyelid-cheek junction laterally. Her upper eyelid was hollow on the right side, and her eyebrow was low but had a horizontal, straight shape.

This procedure was done under local anesthesia with intramuscular midazolam relaxation (3 mg) and took 2 hours and 10 minutes. The patient was discharged 2 hours after surgery.

Surgical Plan

The treatment consisted of:

- Submental liposuction and suction of the jowls
- An extended MACS-lift
- A lower pinch blepharoplasty

Postoperative Results

The patient is shown 1 year postoperatively. The neck skin is tightened and the moderate jowling is corrected. Note the effect on the nasolabial fold. Most striking is the effect of the third suture on the midface. The malar volume has been lifted upward thereby reducing the vertical height of the lower eyelid and causing the eyelid-cheek junction to fade. The transition of eyelid skin into cheek skin is now smoother and looks more youthful. The orbital region looks less skeletonized.

Aesthetic Analysis

This 48-year-old man requested correction of facial rhytids and early laxity. In the frontal view, the most striking feature was the empty midface with very deep nasolabial folds progressing into the marionette grooves. The infraorbital region was hollow with redundant skin. The heavy eyebrows showed a ptotic tail. In the oblique view, the empty midface produced a skeletonized effect on the orbital region. Skin laxity was present in the lower eyelids.

This procedure was done under local anesthesia with intramuscular midazolam relaxation (3 mg) and took 2 hours and 30 minutes. The patient was discharged 2 hours after surgery.

Nonsurgical Plan

The treatment consisted of:

- Botulinum toxin in the frontalis muscle to correct the horizontal forehead wrinkles

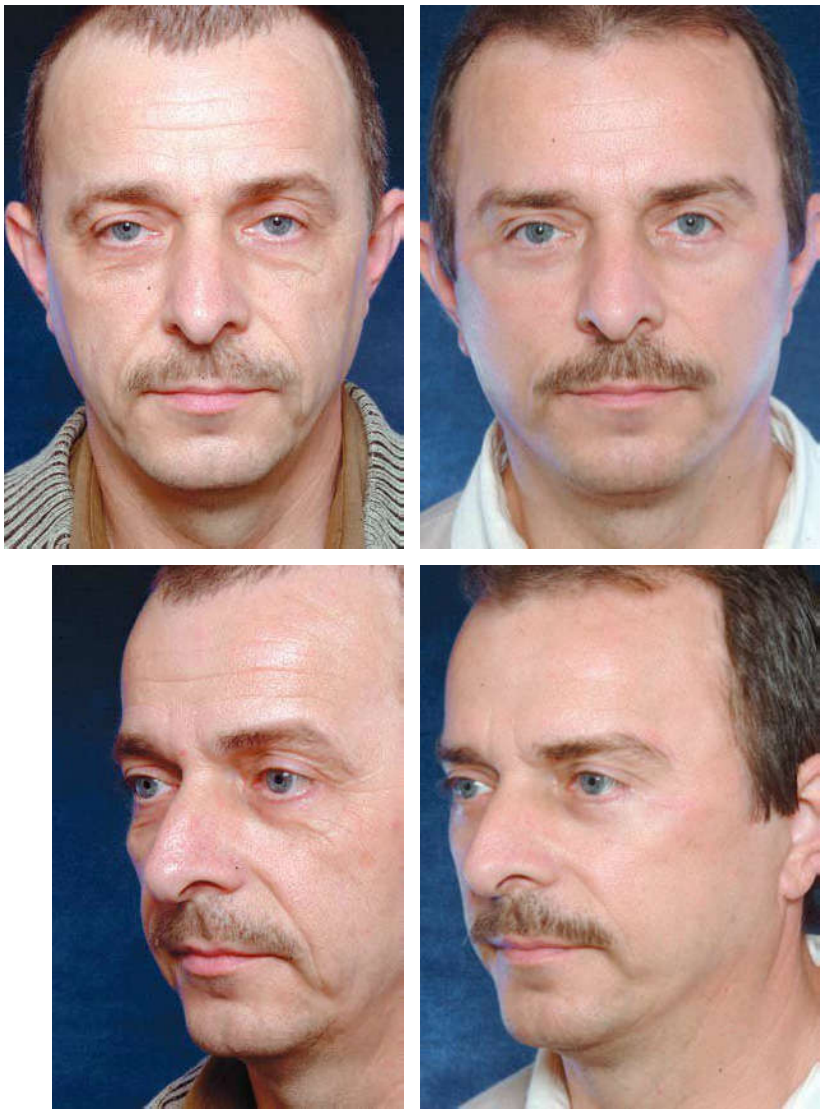
Surgical Plan

The treatment consisted of:

- Submental liposuction and suction of the jowls
- An extended MACS-lift
- A lower pinch blepharoplasty
- Lateral eyebrow ptosis correction by direct excision at the superior margin of the tail of the eyebrow

Postoperative Results

The patient is shown 2 years postoperatively. He shows a striking replenishment of the midface with correction of the nasolabial fold and marionette grooves. The infraorbital hollowing is corrected and the lower eyelid skin is tighter. In the oblique view, note the improved volume distribution in the midface, transforming the skeletonized malar area into a more youthful, healthier shape. Midface replenishment is the result of the action of the third suture and the lower eyelid pinch blepharoplasty. The tail of the eyebrow has a higher position after the direct excision, leaving an inconspicuous scar at the upper limit of the eyebrow hair implantation. The central part of the eyebrow looks more relaxed after treatment with botulinum toxin.



Aesthetic Analysis

This 62-year-old woman requested periocular rejuvenation and minimally invasive facial enhancement. She showed minimal neck laxity, moderate jowling, marionette grooves and nasolabial folds, good architecture of her zygomatic area with incipient demarcation of the eyelid-cheek junction, slight fat herniation of the lower eyelids, and minimal blepharochalasis of the upper eyelids. The eyebrow position was correct.

This procedure was done under local anesthesia with intramuscular midazolam relaxation (3 mg) and took 2 hours and 40 minutes. The patient was discharged 2 hours after surgery.

Nonsurgical Plan

The treatment consisted of:

- A Retin-A skin care program

Surgical Plan

The treatment consisted of:

- Submental liposuction
- An extended MACS-lift
- Transconjunctival fat removal and pinch removal of the lower eyelid skin
- An upper blepharoplasty with minimal fat removal
- Erbium:YAG laser resurfacing of the lower eyelids

Postoperative Results

The 1-year postoperative photos show better definition of the mandibular border after correction of jowling and neck laxity, with a sharpened cervicomental angle maintained during downward gaze. In the oblique view, the effect on the midface is seen in the diminished nasolabial fold; better projection of the malar eminence; and an improved transition of eyelid skin into cheek skin, indicated by the faded eyelid-cheek junction and nasojugal groove. The upper eyelids look more youthful after the upper lid blepharoplasty. Note the excellent quality of the preauricular and temporal prehairline scars, permitting a ponytail-friendly hairstyle.

Aesthetic Analysis

This 56-year-old woman presented for rejuvenation of the lower and middle third of the face. She had platysmal bands in a lax submental and upper neck region, jowls, marionette grooves, downward slanting of the corners of the mouth, upper lip rhytids, marked nasolabial folds, and emptiness of the midface with hollow lower eyelids. She also had hollow, empty upper eyelids and correct eyebrow positioning. Note the inframalar hollow in the oblique view.

This procedure was done under local anesthesia with intramuscular midazolam relaxation (2.5 mg) and took 2 hours and 10 minutes. The patient was discharged 2 hours after surgery.

Surgical Plan

The treatment consisted of:

- An extended MACS-lift
- Upper lip erbium:YAG resurfacing
- A lower pinch blepharoplasty

Postoperative Results

The 1-year postoperative results show correction of the neck and submental laxity (including the plastysmal bands) with restoration of the cervicomental angle; redefinition of the mandibular border; correction of the jowls, marionette grooves, downward slant of the corners of the mouth, and perioral rhytids; diminished nasolabial folds; and a replenished midface and lower eyelids with augmentation of the zygomatic area, producing a youthful curvature on the oblique view.

The downward-gazing view (the so-called Bruce Connell view) not only shows the correction and stability of the cervicomental angle, but also the rejuvenating effect on the lower and middle third of the face.

The detailed views of the middle third of the face demonstrate blending of the lid-cheek junction and reduced vertical height of the lower eyelid.

The detailed views of the lower third of the face highlight perioral rejuvenation and total disappearance of the platysmal bands.

THE NEEDLESS FEAR OF THE TEMPORAL HAIRLINE INCISION

The prehairline incision has a bad reputation among many plastic surgeons. Our experience does not support this concern. If one adheres to the following basic principles, there is no reason to fear this incision.

- Make a zigzag incision and resect the skin in a linear fashion (see Volume I, pp. 48-49). This will help in dealing with little skin folds, because it compensates for the incongruence in length between the incision side and the flap side and will avoid a straight-line scar, which is more visible at the hairline.
- Bevel the incision and excision of skin. Hair will grow through the scar, thereby hiding the final scar a few millimeters within the sideburn.
- Ensure a tension-free closure by avoiding excessive skin excision after vertical skin redraping.
- Do not extend the incision higher than is absolutely necessary. In the majority of cases the incision ends at the level of the tail of the eyebrow. More cranially the skin becomes thinner and the hair implantation less dense, which increases the risk of scar visibility.

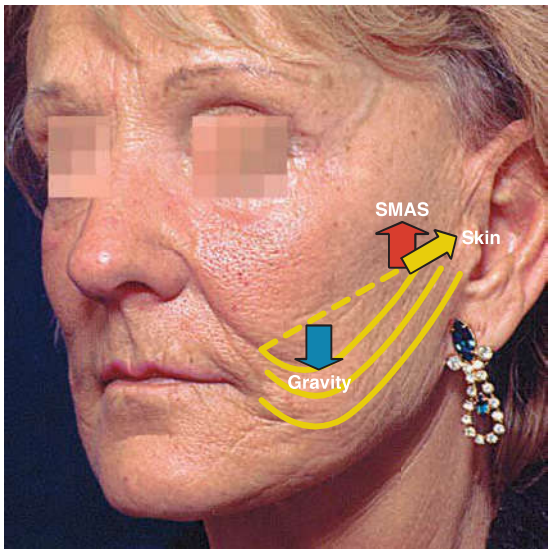
Occasionally, 4 to 6 weeks after surgery, small inclusion cysts may appear on the temporal hairline part of the scar, indicating breakthrough of the hairs. Opening these cysts will free this ingrowing hair. To emphasize that the fear of making these incisions is unwarranted, most of the clinical cases throughout this volume were photographed with hair combed behind the ear.

THE MACS-LIFT AS A SECONDARY FACE-LIFT PROCEDURE

One of the biggest advantages of the MACS-lift is that it generally provides natural-appearing results. The vertical repositioning of facial volumes and skin is strictly an antigravitational maneuver. This means that after the MACS-lift, the face will continue to look natural even after facial soft tissues begin to descend as the result of normal aging processes.

In more than 7 years of experience we still have not seen the *lateral sweep phenomenon* in any of our patients postoperatively. We attribute this result to moving both the deep tissues and skin in parallel in the same vertical direction. We reconsidered the causes of the lateral sweep phenomenon and concluded that it is most likely caused by decomposition of the lateral vector of skin correction and the vertical vector of skin aging. This vector is completely independent of the deep tissue correction, which is vertical or oblique-vertical in

most techniques. Redraping the skin horizontally will invariably lead to a flattened, windswept appearance, if not after the first, then certainly after several face lifts.



In a traditional SMAS face-lift procedure, the SMAS is typically suspended in a mainly vertical direction *(red arrow)*. The skin, however, is redraped more horizontally *(yellow arrow)*, creating a tension on the skin in this direction *(yellow dashed line)*. The vertical component of the skin correction is minimal. Gravity *(blue arrow)* continues to pull downward on the skin flap. Because the tension on the skin flap is mainly horizontal, it has no defense against downward pull and this will result in a curtainlike deformity *(yellow curved lines)* known as the lateral sweep phenomenon.

When creating the skin flap in a secondary face-lift case, we find it remarkable how much the skin sometimes retracts anteriorly, demonstrating a relative shortage of skin in the anteroposterior direction after prior lateral traction on the skin flap. This signifies that there is certainly no relaxation of horizontal tension on the skin—on the contrary! Thus recurrent skin laxity after prior face lifting is only in the craniocaudal direction, creating the downward curved folds of the lateral sweep phenomenon. Therefore even more than in primary face lifting, horizontal traction on the skin is not effective and is absolutely contraindicated when aiming for a natural facial rejuvenation.

Natural Aging

Currently none of our MACS-lift patients have requested reoperation. Nevertheless, we know that aging is natural. The following case is presented to demonstrate long-term results after MACS-lifting.

Aesthetic Analysis

This 63-year-old woman was described in Volume I, p. 190. She presented with general sagging of the midface, obvious nasolabial folds, marionette grooves, jowling, and an obtuse cervicomental angle with obvious platysmal bands. She was one of the first patients on whom we performed an extended MACS-lift. She also had an upper blepharoplasty and a transconjunctival lower blepharoplasty. In the first year that we performed extended MACS-lifts, our third suture was directed more obliquely with its anchor point on the deep temporal fascia next to the first and second anchor point in front of the ear. This shifted the malar fat pad too much laterally (see Volume I, p. 48). No lower pinch blepharoplasty was performed at that time, because we did not lift the malar fat pad vertically enough.

Postoperative Results

The patient is shown 6 years postoperatively, at age 69. On frontal view, the shape of her face still looks more youthful than before the surgery 6 years earlier. The mandibular border has retained a better definition and the jowls and marionette grooves are still corrected. The nasolabial folds have relapsed slightly and the effect in the midface is diminished. This is probably because we used a less effective oblique vector of traction in these early cases. The effect on the cervicomental angle is still visible after 6 years.

The most important lesson we learned from this patient is that aging appears to happen naturally after a MACS-lift procedure. She does not look unnatural or strange as time has passed. No signs of lateral sweep are seen. In a few years, she could benefit from a secondary MACS-lift, which will again deliver the same correction in the vertical direction and provide a natural younger look for 8 to 10 years.

DIFFICULT CASES

A big part of the learning curve in facial rejuvenation surgery consists of the ability to predict which result can be obtained using a certain technique in each patient. For instance, in patients with thick heavy skin, a spectacular result is harder to obtain than in patients with thin skin and fine wrinkles. Similarly, better results are more difficult to obtain in patients with round, full, fat faces compared with patients who have more slender faces. In these cases, small modifications will have to be included to obtain the most desirable result. Counseling is extremely important with these patients to determine their level of expectation. The difficult patient has expectations significantly higher than what can be delivered with the surgeon's standard technique. Sometimes it is wise to bring the patient's expectations down to a more realistic level instead of suggesting more complicated and risky surgery. Otherwise, the risk of creating a disappointed patient increases if the final result does not fulfill his or her expectations. The experienced surgeon knows that in some patients a perfect result is simply technically impossible, regardless of the technique used. The goal of every aesthetic surgery is a happy patient, not a spectacular result.

In the difficult cases described on the following pages, it was explained to the patients why a spectacular result would be hard to obtain.

Aesthetic Analysis

This 55-year-old woman presented with the following signs of an aging face with thick sebaceous skin on heavy facial features: a tired look, very marked nasolabial folds, and some jowling and laxity in the cervicomental angle, which appeared to be pure skin excess. She had previously undergone an upper blepharoplasty elsewhere that was of little or no benefit in correcting her tired look. The patient was a smoker.

This procedure was done under local anesthesia with intramuscular midazolam relaxation (3 mg) and took 2 hours 20 minutes. The patient was discharged 2 hours after surgery.

Nonsurgical Plan

The treatment consisted of:

- A skin care regimen with retinoic acid
- Information about the deleterious effect of smoking on the facial skin

Surgical Plan

The treatment consisted of:

- Submental and jowl liposuction
- An extended MACS-lift
- A lower pinch blepharoplasty
- A short-scar temporal lift

The patient resumed social activities in 4 weeks. This is more than average and can be expected because of the heavy and thick facial skin. The edema of the eyelids was especially long standing.

Postoperative Results

The patient is shown 10 months postoperatively. On frontal view, the shape of the face has changed from rectangular to more oval after correcting the jowling and improving the mandibular border. The marionette grooves have faded and the effect on the nasolabial folds is quite remarkable. The midface is replenished with a diminished nasojugal groove and reduced vertical height of the lower eyelid. The lower eyelid skin seems tighter. Ptosis of the tail of the eyebrow is nicely corrected without changing the position of the medial part of the eyebrow. The skin tone and texture are improved as a result of the retinoic acid skin care treatment.

In the oblique view, note the effect on the neck, mandibular definition, and especially malar volume resulting from the third suture placement. Transition of lower eyelid skin into cheek skin is diminished. Note also the higher position of the lateral part of the eyebrow and subsequent correction of the temporal hooding, which can also be appreciated in the profile view.

If no temporal lift had been added in this procedure, bulging of the heavy thick skin in the paracanthal region would definitely have occurred, creating an aesthetically unattractive result. The quality of her temporal hairline scar enables her to wear her hair back, leaving the auricle free.

Aesthetic Analysis

This 49-year-old woman presented for facial rejuvenation. She had very heavy facial tissues, an obvious skin excess in the neck, moderate jowling, downward slanting of the corners of the mouth, very marked nasolabial folds, midcheek hollow, empty infraorbital regions with loose lower eyelid skin, upper blepharochalasis with fat herniation, and heavy eyebrows with a drooping tail producing temporal hooding and midglabellar and frontal frowns.

This procedure was done under local anesthesia with intramuscular midazolam relaxation (3 mg) and took 2 hours and 40 minutes. The patient was discharged 2 hours after surgery.

Nonsurgical Plan

The treatment consisted of:

- A skin care regimen with retinoic acid
- Botulinum toxin in corrugator and medial frontalis muscles

Surgical Plan

The treatment consisted of:

- Submental liposuction
- An extended MACS-lift
- Microfat grafting of the nasolabial fold with abdominal fat after freeing the fold with a pickle fork (cannula)
- A lower pinch blepharoplasty
- An upper blepharoplasty with fat resection in both compartments
- A short-scar temporal lift with galeapexy

Postoperative Results

The patient is shown 1 year postoperatively. Her facial volume is obviously affected. The cervicomental angle is improved. The mandibular border has better definition and jowling is corrected. The effect on the midface is remarkable: the nasolabial folds are softened, the midcheek and infraorbital hollow are corrected, and the transition from lower eyelid skin into cheek skin is improved. Puffy upper eyelids are corrected and the tail of the eyebrow is repositioned to correct lateral hooding. The latter is best seen as a change in curvature of the eyebrow in the oblique and profile views. The combination of vertical lifting of the malar fat pad and subcision with lipofilling of the nasolabial fold works synergistically to almost completely efface the fold. The profile view also shows a good but not spectacular result on the cervicomental angle. This results from true skin excess in the neck and might have been better corrected by more extensively undermining the neck. Most of the rejuvenating effect in this patient is the result of changes in the midface. The final scar is about 10 cm long and of good quality. The scar stops at the earlobe and there was no retroauricular dissection.

Aesthetic Analysis

This 63-year-old woman presented for facial rejuvenation with minimal invasiveness. She asked if she could benefit from laser resurfacing alone. She had thick, elastotic sun-damaged skin with deep rhytids and grooves down to her sternal notch. She had skin laxity in her neck with obvious platysmal bands, jowling, and a ptotic submandibular gland; and a deep nasolabial groove with concentric rhytids toward the cheek. She showed a midcheek hollow and marked eyelid-cheek junctional groove. She had previous upper eyelid surgery and showed a temporal hooding with ptosis of the tail of the eyebrow. She also had marked glabellar lines.

With careful counseling we were able to explain to the patient that laser resurfacing alone would correct part of the fine lines and rhytids, but would not correct the skin laxity and the volume changes she presented.

This procedure was done under local anesthesia with intramuscular midazolam relaxation (3.5 mg) and took 3 hours. The patient was discharged 2 hours after surgery.

Surgical Plan

The treatment consisted of:

- Submental liposuction
- An extended MACS-lift
- Perioral erbium:YAG laser resurfacing
- A lower pinch blepharoplasty
- A short-scar temporal lift by galeapexy
- Posterior cervicoplasty (see Volume I, p. 210)

She refused any treatment of the glabellar frown lines and was very upset with the “long recovery” (4 weeks). She was eventually happy with the result.

Postoperative Results

The patient is shown 14 months postoperatively. In general, the results show a very natural rejuvenation with an obvious shift in volume distribution without an "operated look." Because of the bad skin quality, vertical skin folds appear in the infralobular lateral neck region necessitating a posterior cervicoplasty. The rejuvenating effect in the neck is seen down to the sternal notch. Cervicomental laxity and platysmal bands are well corrected along with the jowling, which contributes to improved definition of the mandibular border. By suspending the lateral part of the platysma in a vertical direction, the ptotic submandibular gland is shifted to its original position. The midcheek and infraorbital hollow are nicely corrected, thereby fading the eyelid-cheek junction. The lower eyelid appears shorter in vertical height and the transition of eyelid skin into cheek skin is smoother. The temporal hooding is corrected and the shape of the eyebrow shows a more youthful straighter curve because the lateral part is lifted. The profile view shows an obvious correction of both the cervicomental angle and platysmal banding. The downward-gazing view shows not only the stability of the correction in the neck, but also in the whole face. The adequate quality of the scars is seen in the detailed views of the final scars in the preauricular, temporal, and occipital areas.

This case was difficult because the patient was very reluctant to undergo surgery. She thought she could be helped with laser resurfacing alone. The solution was to offer her a combination of simple, effective, and safe procedures that would give her a natural rejuvenation.

Aesthetic Analysis

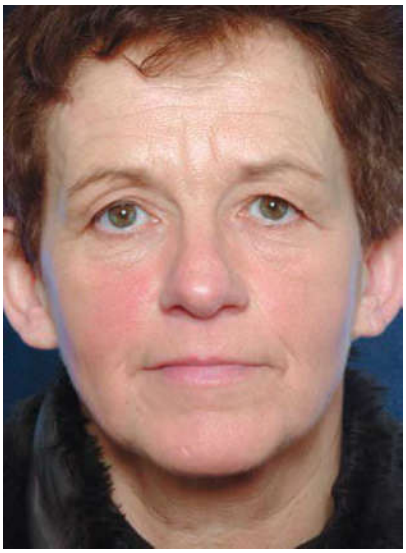
This 56-year-old woman requested total facial rejuvenation to include the neck, midface, eyelids, and eyebrows. She also wanted the nasal deformity and the protruding ears corrected. Her main concern was her tired look. She presented with moderate neck laxity, jowling, marionette grooves, and nasolabial folds. She had an empty midface with a marked junction between eyelid and cheek, loose lower eyelid skin with fine rhytids, and an obvious upper blepharochalasis with a drooping tail of the eyebrow. Her nasal deformities consisted of a dorsal hump and a wide dorsum, with a broad undefined tip. The auricular deformity is obvious.

This procedure was done under general anesthesia and took nearly 4 hours. The patient stayed overnight and was discharged the next day.

Surgical Plan

The treatment consisted of:

- Submental liposuction
- An extended MACS-lift
- A lower pinch blepharoplasty with discrete fat removal from medial and median compartments
- An upper blepharoplasty with skin, muscle, and fat removal
- A short-scar temporal lift by galeapexy
- Open rhinoplasty with hump removal, lateral osteotomy, and tip rhinoplasty
- Correction of protruding ears



Postoperative Results

The patient is shown 2 years postoperatively. We can see a stable correction of the cervicomental angle, jowling, marionette grooves, and nasolabial folds. Most obvious is the periocular rejuvenation, with a striking effect on the midface, eyelid-cheek junction, and tightness of the lower eyelid skin without any change in eyelid position. The redundant upper eyelid skin has been removed. Repositioning of the ptotic eyebrow tail was mandatory because of the low position of the eyebrow and the obvious temporal hooding. An isolated extended MACS-lift would definitely have provoked skin bunching in the paracanthal area, which can nicely be corrected by a short-scar temporal lift. The correction of the nose and the ears can be appreciated. Note also the good quality of the preauricular and temporal hairline scar.

The difficulty in this case was the complexity of combining different procedures. Because of the time efficiency of MACS-lift surgery, other interventions such as rhinoplasty and/or otoplasty could be included in the same operative time. It is our conviction that surgeries longer than 4 hours become boring for the surgeon and anesthesiologist and potentially detrimental for the patient. Within this time, many surgeries can be combined.

Aesthetic Analysis

This 53-year-old woman asked for facial rejuvenation with minimal invasiveness. She wore her hair short and did not want any scar behind the ear. She presented with laxity in the neck with platysmal bands, jowls, marionette grooves, fine perioral rhytids on thin lips, a marked nasolabial fold, and an empty deflated midface with obvious demarcation between cheek and eyelid. She also requested correction of her nasal hump, hanging columella, and breast hypoplasia.

The surgeries were done with two teams (one facial and one breast team) with the patient under general anesthesia and took 3 hours. The patient stayed overnight and was discharged the next day.

Surgical Plan

The treatment consisted of:

- Submental liposuction
- An extended MACS-lift
- A lower pinch blepharoplasty
- Microfat grafting of the nasojugal groove (1 cc/side), zygomatic area (9 cc/side), upper lip (5 cc in vermilion and whole upper lip), lower lip (3 cc), nasolabial groove and corner of the mouth (1.5 cc/side)
- Upper lip erbium:YAG laser resurfacing
- Open rhinoplasty with hump reduction, tip refinement, and correction of the columellar-alar relationship
- Augmentation mastopexy

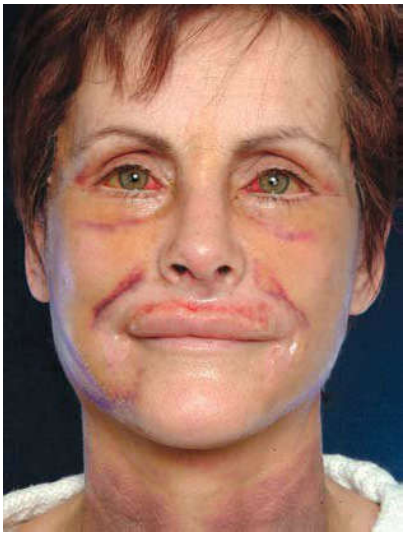
Postoperative Results

The patient is shown 10 months postoperatively. The early postoperative views show the extra morbidity of lipofilling after 1 and 3 weeks. The final results, however, show how rewarding this additional procedure can be. Results show satisfactory correction of the cervicomental angle, jowls, marionette grooves, nasolabial folds, and an obvious replenishment of the midface. This can be best seen in the oblique view in which the flat zygomatic area is transformed into a highlighted youthful malar eminence. The eyelid-cheek junction is faded. The upper and lower lips are naturally augmented and fine rhytids are eradicated by the laser treatment. The rhinoplasty has a complementary rejuvenating effect on the other surgeries.

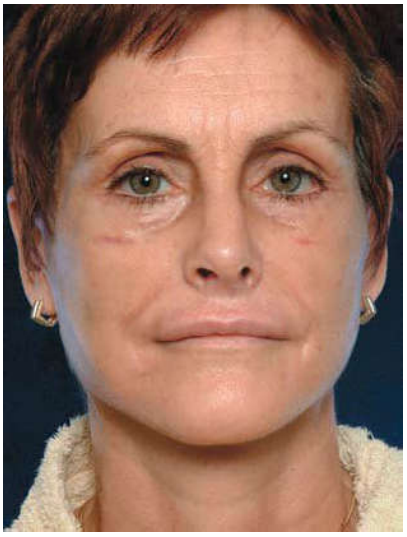
The detailed view of the final scar shows that they are inconspicuous with a short haircut. Even when the temporal hairs are pushed away, the temporal prehairline scar is hardly visible.

The difficulty in this case was the extra augmentation required in this thin patient with facial hollowing. Microfat grafting was definitely the best adjunctive solution and offered a complementary rejuvenation that cannot be obtained by classical lifting procedures alone.

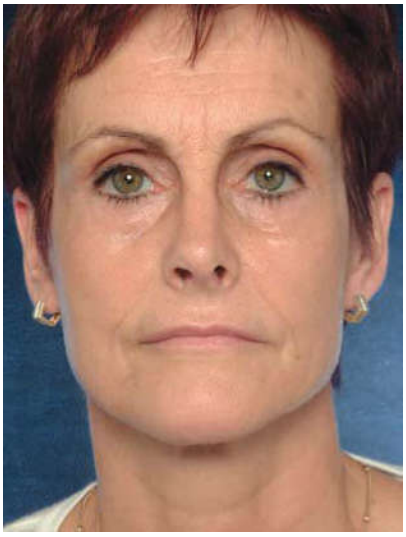
This patient also demonstrates that different surgeries can easily be combined within a reasonable time schedule.



1 week postoperatively



3 weeks postoperatively



10 months postoperatively

Aesthetic Analysis

This 66-year-old man presented for a facial rejuvenation procedure after his wife had a secondary face lift by an extended MACS-lift. He had neck skin laxity with marked folds down to his occipital region, jowls, marionette grooves, nasolabial folds, an empty midface, and lower blepharochalasis with an obvious fat herniation. Two years earlier he had an acute myocardial infarction and a year later a stent was placed in his right coronary artery. He is under anticoagulation therapy and smokes 1 pack of cigarettes a day.

This procedure was done under local anesthesia with intramuscular midazolam relaxation (3.5 mg) and took 2 hours and 50 minutes. The patient was discharged 2 hours after surgery.

Surgical Plan

The treatment consisted of:

- Submental liposuction
- An extended MACS-lift
- Posterior cervicoplasty (see Volume I, p. 210)
- A transconjunctival lower blepharoplasty with pinch skin resection

Postoperative Results

The patient is shown 1 year postoperatively. The most striking result is in the midface—the nasolabial folds are improved, the infraorbital hollow is replenished, the vertical height of the lower eyelid is shortened. He had a slight relapse of his cervicomental angle, but good correction of jowling and better definition of the mandibular border. The posterior neck skin is redraped posteriorly through an occipital prehairline incision to correct the vertical folds that appeared at the infralobular region after an extended MACS-lift. Although all procedures were minimally invasive and subcutaneous dissection was limited to what was strictly necessary, a small wound dehiscence occurred in this high-risk case. The small area of skin necrosis healed by secondary intension and left a small atrophic scar that was hardly noticeable, even with his short haircut. The occipital prehairline scar healed well. We were able to offer this man a substantial facial rejuvenation without too many risks. In view of the small area of skin necrosis in this case, more aggressive undermining and extensive dissection would definitely have increased the risks of even more necrosis.

The Difficult Nasolabial Fold

Aesthetic Analysis

This 53-year-old woman lost 60 kg after gastric bypass surgery and was diagnosed with depersonalization. The woman she saw in the mirror did not correspond with the person she felt she was. Her empty midface and heavy nasolabial folds were especially problematic for her. The skin laxity in her cheeks and neck when looking downward was particularly distressful for her.

This procedure was done under local anesthesia with intramuscular midazolam relaxation (3.5 mg) and took 2 hours and 30 minutes. The patient was discharged 2 hours after surgery.

Surgical Plan

The treatment consisted of:

- Submental liposuction
- An extended MACS-lift
- A lower pinch blepharoplasty
- An upper blepharoplasty

Postoperative Results

The patient is shown 1 and 3 years postoperatively. The submental skin excess is corrected and the jawline definition is improved with correction of the moderate jowling. Most remarkable is the very stable correction of the nasolabial fold with good replenishment of the midface and lower eyelid region. Note the improved skin turgor in the cheeks. The transition of lower eyelid skin into cheek skin seems smoother and the vertical height of the lower eyelid appears to be reduced.

In the profile view at 1 year, she does not mind wearing her hair back in the retroauricular region because there is no retroauricular scar to be hidden. Comparison of the downward-gazing profile view between 1 and 3 years reveals a slight relaxation of the submental skin, but it is still a nice improvement compared with the preoperative view. This patient was treated before we started microfat grafting and short-scar temporal lifting. Otherwise, these would have been performed as well.

Preoperative

1 year postoperatively

3 years postoperatively

Preoperative | 1 year postoperatively | 3 years postoperatively

Aesthetic Analysis

This 48-year-old woman presented for facial rejuvenation and was mainly concerned with her deep and long nasolabial folds. She had neck skin laxity with moderate platysmal banding and submental fatty deposits, moderate jowling, and very deep and sharp nasolabial folds extending into the marionette grooves. She had thick oily skin, an infraorbital hollow, a marked eyelid-cheek junction, and fat hernias in the lower eyelids.

This procedure was done under local anesthesia with intramuscular midazolam relaxation (3.5 mg) and took 2 hours and 10 minutes. The patient was discharged 2 hours after surgery.

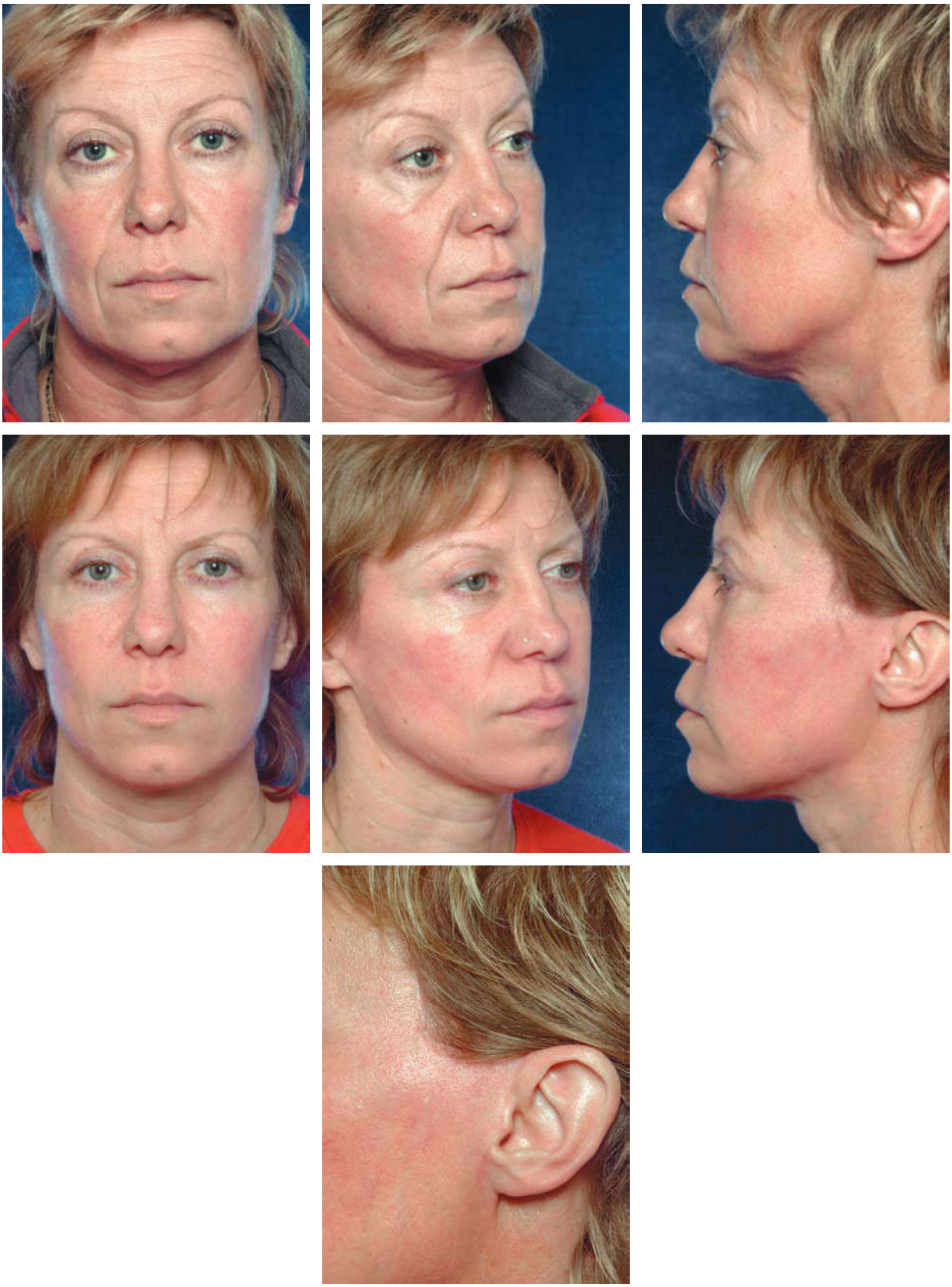
Surgical Plan

The treatment consisted of:

- Submental liposuction
- An extended MACS-lift
- A lower pinch blepharoplasty and transconjunctival fat removal
- Subcision and microfat grafting of the nasolabial folds (2 cc/side)

Postoperative Results

The patient is shown 12 months postoperatively. Correction of the submental region and jowls is good. Most striking is the very effective softening of the nasolabial folds, which is a combined effect of midfacial lifting via the third suture, the subcision, and the microfat grafting. Each of these maneuvers separately could never result in a comparable improvement. The lid-cheek junction is faded and fat bulging of the lower lid is corrected. Note the good quality of the preauricular and temporal prehairline scars.



The Prominent Submandibular Gland

Aesthetic Analysis

This 59-year-old man presented for a facial rejuvenation. His main concern was submental laxity and deep nasolabial folds. He had submental skin laxity with platysmal bands and jowling, which were mainly obvious in the downward-gazing view. Also note the prominent submandibular gland on the left side. He had deep nasolabial folds, a hollow midcheek, distension of the lower eyelid, and a degree of blepharochalasis.

This procedure was done under local anesthesia with intramuscular midazolam relaxation (4 mg) and took 2 hours. The patient was discharged 2 hours after surgery.

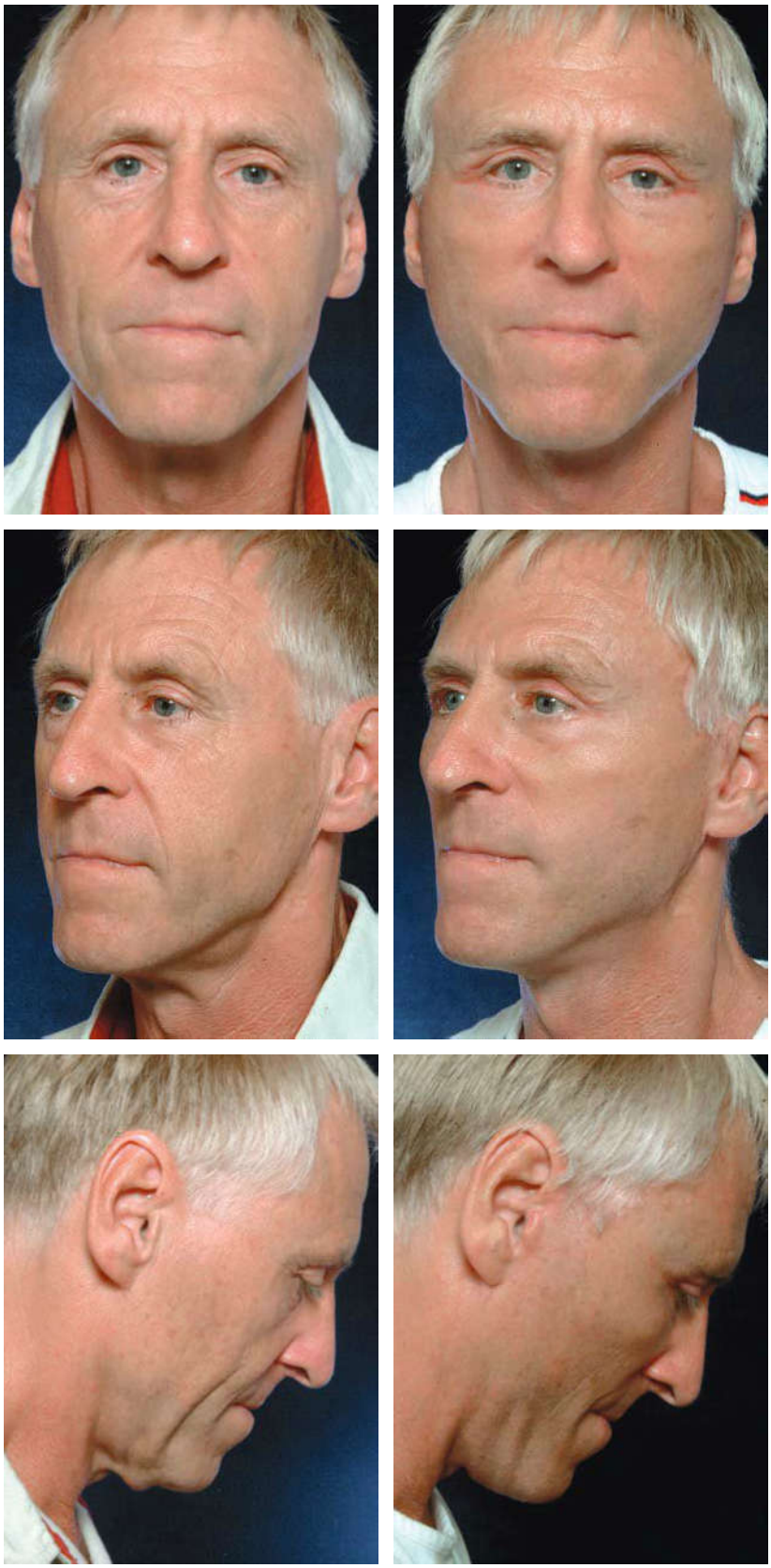
Surgical Plan

The treatment consisted of:

- Submental liposuction
- An extended MACS-lift
- An upper blepharoplasty
- A lower pinch blepharoplasty

Postoperative Results

The patient is shown 8 months postoperatively. The facial contour is improved toward a more oval shape with better mandibular definition. The nasolabial grooves and concentric expression rhytids are diminished, the midface is replenished, the infraorbital hollow is corrected, and his lower eyelid skin is tightened. On the profile view with downward gazing, submental skin laxity, jowling, and deep facial grooves are corrected. Note the inconspicuous preauricular and temporal prehairline scars, the correct position of the sideburn, and the absence of hair growth on the tragus, the result of vertical skin redraping. In the oblique view, note the corrected platysmal bands. Submandibular gland bulging is corrected, attributable to improved support provided by the cranial suspension of the lateral platysmal border. A marked volumetric lifting effect is seen in the midface with a harmonic ogee curve on the contralateral side.



Aesthetic Analysis

This 43-year-old woman presented because of precocious facial aging. She was very concerned about her "sad look." She also asked for a nasal correction.

The patient had a poorly defined facial shape. The frontal view showed quite pronounced jowling for her age, ptosis of the midfacial volumes, and thin undefined lips. In the oblique view, the most striking features were jowling, nasolabial and marionette grooves, and an increased length of the lower eyelid. She had ptosis of the tail of the eyebrow with temporal hooding. The profile view revealed a blunt cervicomental angle, weak chin, and marionette grooves. Her nose mainly showed tip overprojection and a hypertrophic nasal spine. All of these factors along with her facial imbalance contributed to the difficulty of this case.

The patient was treated during the Controversies, Art, and Technology in Facial Aesthetic Surgery (CATFAS) meeting in Gent in 2004. This procedure was done under general anesthesia because a rhinoplasty was also performed.

Nonsurgical Plan

The treatment consisted of:

- Lipofilling of the lips under local anesthesia at a later time

Surgical Plan

The treatment consisted of:

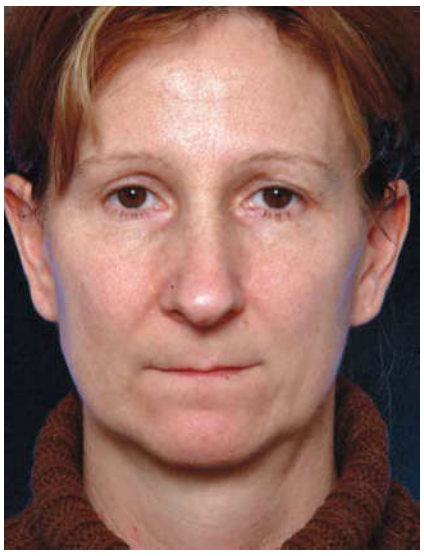
- Submental liposuction (by Dr. Alexis Verpaele)
- An extended MACS-lift (by Dr. Alexis Verpaele)
- Fogli temporal lift by fasciapexy (by Dr. Alain Fogli)
- An upper blepharoplasty (by Dr. Alexis Verpaele)
- An open rhinoplasty (by Dr. Gilbert Aiach)
- Chin augmentation with Restylane SubQ (two × 2 cc; by Dr. Alexis Verpaele)
- Lip augmentation by microfat grafting 8 months postoperatively (by Dr. Alexis Verpaele)

Postoperative Results

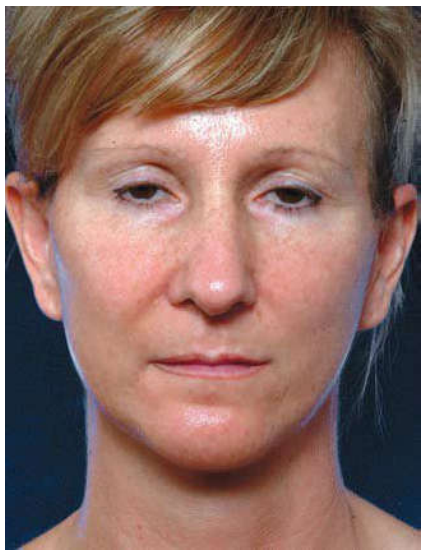
The patient is shown 1 and 2½ years postoperatively. A general improvement of the facial aesthetics is seen. The frontal views show a marked improvement of the lower facial appearance, shifting from a rather dull rectangular to a pleasing oval shape with a well-defined mandibular border. The jowling and marionette grooves are corrected, the nasolabial folds are softened, and the cheeks and the infraorbital hollow are replenished.

The oblique view shows better definition of the mandibular border and the lifted position of the corners of the mouth. Note the volumetric restoration of the facial ogee caused by the vertical repositioning of lower facial volumes. The lid-cheek junction is well blended. Also note the lifted position of the tail of the eyebrow and the unfolded temporal region.

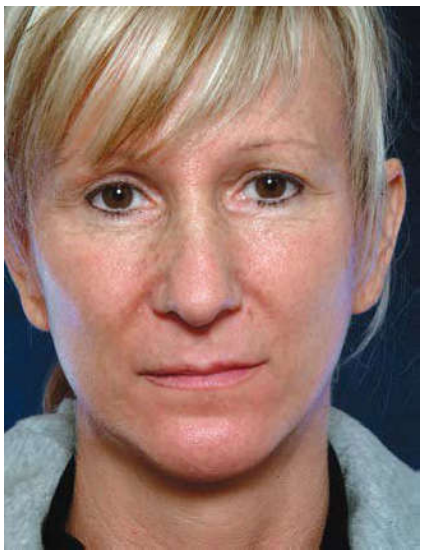
In the profile view, stable correction of the submental area can be appreciated. Chin augmentation with Restylane SubQ lasted more than 2 years without touch-up. The correction of the marionette grooves and the midface lifting are stable. Also note the good quality of the scar and the good volume and projection of the lips. The overprojected nasal tip is corrected.



Preoperative



1 year postoperatively



2½ years postoperatively

Preoperative | 1 year postoperatively | 2½ years postoperatively

Surgical Pearls

- Avoid opening the neck if possible.
- In the neck as in the face, the vertical vector is the rejuvenating one.
- Secure platysma suspension is essential for long-term correction.
- Less is still more than enough in most cases.
- Sutures are only necessary for temporary stabilization of subcutaneous sculpturing work.
- The long-term stability of the correction is not dependent on the suture but on the combination of subcutaneous sculpturing techniques with parallel vertical redraping and trimming of the skin.
- Use the third malar suture: lifting the midface provides a foundation to the lower eyelid and completes facial rejuvenation. It stably repositions the malar fat pad in its original position without risk of overcorrection.
- All vertical face lifts need a temporal prehairline incision to avoid raising the sideburn.
- The MACS-lift can safely be used after any previous face-lift procedure.
- Even in difficult cases the MACS-lift is a valuable option.
- Some patients definitely need additional volume. Microfat grafting is an elegant method of stable tissue augmentation

BIBLIOGRAPHY

Aston SJ, Bernard RW, Casson PR, et al. Secondary face lift. Panel discussion. Aesthetic Surg J 22:277-283, 2002.

Baker D, Massiha H, Nahai F, Tonnard PL. Short scar face lift. Panel discussion. Aesthetic Surg J 25:607-617, 2005.

Camirand A, Doucet J. A comparison between parallel hairline incisions and perpendicular incisions when performing a face lift. Plast Reconstr Surg 99:10-15, 1997.

Coleman SR. Structural fat grafting: More than a permanent filler. Plast Reconstr Surg 118(3 Suppl):S108-S120, 2006.

Connell BF, Semlacher RA. Contemporary deep layer facial rejuvenation. Plast Reconstr Surg 100:1513-1523, 1997.

Ellies M, Gottstein U, Rohrbach-Volland S, et al. Reduction of salivary flow with botulinum toxin: Extended report on 33 patients with drooling, salivary fistulas, and sialadenitis. Laryngoscope 114:1856-1860, 2004.

Feldman JJ. Neck Lift. St Louis: Quality Medical Publishing, 2006.

Grover R, Jones BM, Waterhouse N. The prevention of haematoma following rhytidectomy: A review of 1078 consecutive facelifts. Br J Plast Surg 54:481-486, 2001.

Labbé D, Franco RG, Nicolas J. Platysma suspension and platysmaplasty during neck lift: Anatomical study and analysis of thirty cases. Plast Reconstr Surg 117:2001-2009, 2006.

Paul MD, Calvert JW, Evans G. The evolution of the midface lift in aesthetic plastic surgery. Plast Reconstr Surg 117:1809-1827, 2006.

Singer D, Sullivan P. Submandibular gland I: An anatomic evaluation and surgical approach to submandibular gland resection for facial rejuvenation. Plast Reconstr Surg 112:1150-1154, 2003.

Tonnard PL, Verpaele A. 300 MACS-lift shortscar rhytidectomies: Analysis of results and complications. Eur J Plast Surg 28:198-205, 2005.

Tonnard PL, Verpaele A. The MACS-Lift Short-Scar Rhytidectomy. St Louis: Quality Medical Publishing, 2004.

Tonnard PL, Verpaele A. Optimizing results from minimal access cranial suspension lifting (MACS-lift). Aesthetic Plast Surg 29:213-220, 2005.

Tonnard P, Verpaele A, Monstrey S, et al. Minimal access cranial suspension lift: A modified S-lift. Plast Redonstr Surg 109:2074-2086, 2002.

Verpaele A, Tonnard PL, Pirayesh A, et al. The third suture in MACS-lifting: Making midface lifting simple and safe. J Plast Reconstr Aesthet Surg (in press).

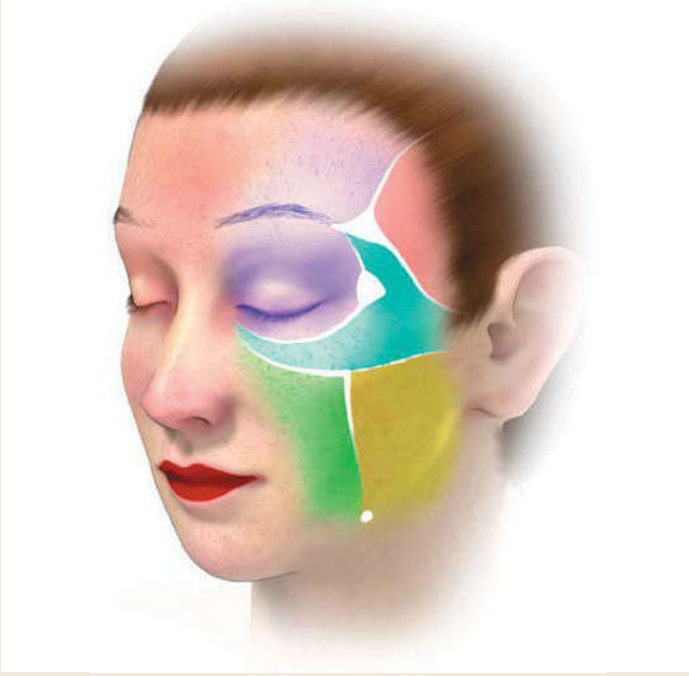
Chapter

5

The MACS-Lift Short-Scar Face Lift

Technical and Strategic Considerations

Mark Laurence Jewell



Refinements and new techniques in facial rejuvenation surgery are regularly reported in the literature and in scientific forums. On closer examination, however, many of these merely represent incremental improvements to existing techniques. Historically, there has been a pendulum effect between conventional and extremely invasive approaches. In retrospect, we often seem to be more focused on moving between different technical solutions than on understanding how to effectively perform facial rejuvenation on a diverse patient population.

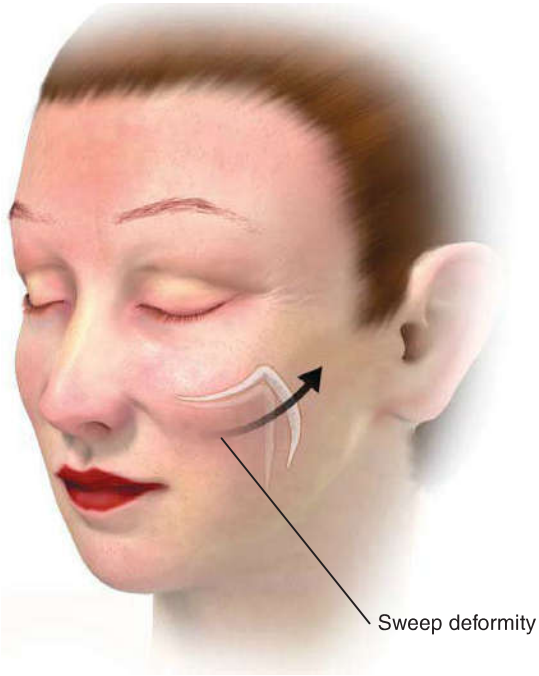
The short-scar face lift represents a departure from this pendulum and a true advance in the evolution of facial rejuvenation surgery. For the innovators of this alternative approach, it represented an "Aha" moment, yet years later, the complete details of this innovation remain to be fully delineated. Although many individuals have been credited with the development of the short-scar approach, Patrick Tonnard, Alexis Verpaele, and Daniel Baker have done much to advance this operation. Others such as Mendelson, Besins, Labbé, and Gardetto have laid the groundwork with facial anatomy studies that have shown how we can achieve facial rejuvenation through a less-invasive approach. Much of this is a rethinking of how to reposition fat and deeper layers rather than use skin-tightening procedures.

RETHINKING THE APPROACH TO FACIAL REJUVENATION

As surgeons we sometimes become more enamored of the technical aspects of the operations we perform than of the goals we are trying to achieve, and less mindful of the limitations that bar us from attaining them. We enjoy taking things apart and then reassembling them to produce a transformation, as we do in facial rejuvenation surgery. There is a challenge associated with these operations when we venture into "lion and tiger country," operating in potential danger areas beneath the SMAS and close to the facial nerve branches, where the possibility lurks of direct damage to nerve branches and loss of animation in facial muscle.

Over the years, many surgeons have embraced "classic" approaches to rhytidectomy, because these familiar operations are straightforward and allow wide, open exposure of facial structures. However, outcomes have varied widely, depending on the variable clinical presentation of patients as well as the ability of the individual surgeon to release and reposition deeper structures. From a biomechanical perspective, the diagonal vectors of these classic procedures often fail to produce the desired volume redistribution between deeper and superficial layers. From a patient's perspective, the potential complications of hypertrophic postauricular scarring, facial flattening, and a pulled, unnatural appear-

ance detract from the aesthetic, natural outcome they expect and make these classic face-lift techniques less appealing.



The sweep deformity, which resembles the NIKE "swoosh" trademark, is an all too frequent sign of a poor surgical outcome from these procedures and is a major source of patient dissatisfaction. This problem is attributable to incomplete release of facial structures and to the use of horizontal traction vectors.

We may be faulted for failing to fully examine the limits of the procedures we perform and to accurately assess our ability to deliver optimal rejuvenation. More thought must be devoted to the goals of facial rejuvenation and the most effective way to achieve these surgically. On closer examination, the classic face-lift techniques that we have relied on for so long no longer serve the needs of many of our current patients. There is a dichotomy between these deeply invasive procedures and patient requests and expectations. Today's patient wants a natural-appearing, safe, and predictable outcome, but with convenience, reduced morbidity, and a shorter recovery time.

Many patients turn to nonsurgical cosmetic treatments to achieve facial rejuvenation without the sequelae or recovery time associated with surgery. There is a definite role for complementary procedures to enhance the results of facial rejuvenation surgery, but we must understand the limits of what these nonsurgical treatments can accomplish. There is a current tendency to place enormous value on simple, often minimally effective ancillary procedures to enhance facial rejuvenation. However, the first emphasis should be on perform-

ing the fundamental, mandatory parts of the operative procedure to redistribute volume, tighten lax skin, and ensure precise redraping of the skin and deeper layers back to their natural points of fixation. Even excessive use of nonsurgical skin layer treatments (laser and radiofrequency energy) will not compensate for inadequate surgical technique to produce facial volume redistribution.

The current barbed-suture facial rejuvenation techniques have attracted considerable attention because they seem to offer a classic rhytidectomy in a minimally invasive fashion. Although these barbed-suture approaches may have some value in facial rejuvenation, we may be asking too much of a minor ancillary procedure in lieu of a more definitive procedure. It is likely that the enthusiasm for nonabsorbable barbed sutures will fade when surgeons are faced with the removal of multiple suture strands in the future or have to deal with the associated complications, which include possible damage to the salivary gland duct, extrusion, pain, and visible suture strands. Even in situations in which barbed-suture loops are placed to simulate tightening of deeper layers, there are no data that demonstrate their safety and long-term effectiveness.

Although the classic face lift still has value in patients with pronounced face and neck laxity, it is not the preferred option for many younger patients or those who want facial rejuvenation without the need for extensive surgical procedures that come with associated morbidity and scarring. A variety of deeper, more invasive approaches for facial rejuvenation at the subperiosteal level have also not been widely accepted because of concerns about motor nerve injury, swelling, and prolonged recovery time. Although surgeons agree that there is a need to have procedures that rejuvenate the midface, few agree about which techniques are most effective and present the least risk.

In summary, we must continue to think about the quality of our work, what limits our results, and how we can provide the best results for our patients. Advances in the quality of outcomes in breast surgery were achieved when we based our decisions on tissue characteristics and implant dimensions. A similar approach is needed for facial rejuvenation.

Short-Scar Surgical Technique

Over the years, the short-scar approach has proven to be an alternative to the classic form of facial rejuvenation. Sherrell Aston and Foad Nahai deserve credit for their role in providing a forum for introducing and discussing these short-scar face-lift procedures in symposia and publications.

Short-scar approaches in concept allow for the redraping of skin and repositioning of deeper layers back to points of fixation without excessive surgical

dissection. There is a sound anatomic basis for how short-scar techniques accomplish volume redistribution. From a biomechanical engineering perspective, there is support for this approach's ability to tighten the face and neck without disintegration of the facial lamellae (skin, subcutaneous fat, SMAS, and sub-SMAS fat).

Daniel Baker accomplishes facial rejuvenation with excision of SMAS tissue to vertically pull facial structures. He also incorporates a biaxial pull on the platysma for neck tightening. (See Chapter 6 for more detailed information on this technique.) Dr. Baker has remained steadfast in his criticism of deeper, more invasive approaches. The innovations of Tonnard and Verpaele have yielded a different approach that uses suture loops to tighten and reposition all three zones of the face as described by Mendelson. The temporalis fascia is a robust anchor point for the platysma and cheek loops, preferable to Loré's fascia, as described by Labbé. The zygomatic periosteum, lateral to the external canthal area, is a sufficient anchor for the midface loop. Other surgeons have now taken the concepts of Baker, Tonnard, and Verpaele as a foundation for additional innovation in facial rejuvenation.

Baker, Tonnard and Verpaele, and other short-scar advocates are not attempting to perform a "classic" lift through a short-scar approach; their approaches rely on a hairline incision in front of the ear. Mastery of the short-scar approach requires the use of a variety of "component" techniques, such as the temporal brow lift, lipoplasty/platysmaplasty to anterior neck structures, and a full range of oculoplastic procedures.

UNDERSTANDING THE MACS-LIFT EFFECT

My interest in the MACS-lift stemmed from first reading Tonnard and Verpaele's publications, then performing a few cases, visiting and watching them operate, and reinforcing my understanding in the cadaver laboratory. With the MACS-lift, I am now able to offer my patients a technique that effectively tightens skin and restores the deeper structures to natural points of fixation without the downside associated with more invasive procedures.

The basis for the claim of efficacy and safety in the MACS-lift short-scar face lift has been well established by Tonnard and Verpaele in the years that they have been performing the procedure. The techniques used in this operation have a biomechanical and anatomic basis that far exceeds the "microimbrications" that the authors described in their first publications on the subject. I prefer to look conceptually at this effect as a "gathering phenomenon" of the SMAS layer of the face and attached skin by the suture loops. The volume is redistributed when the suture loops tighten the SMAS and bring attached su-

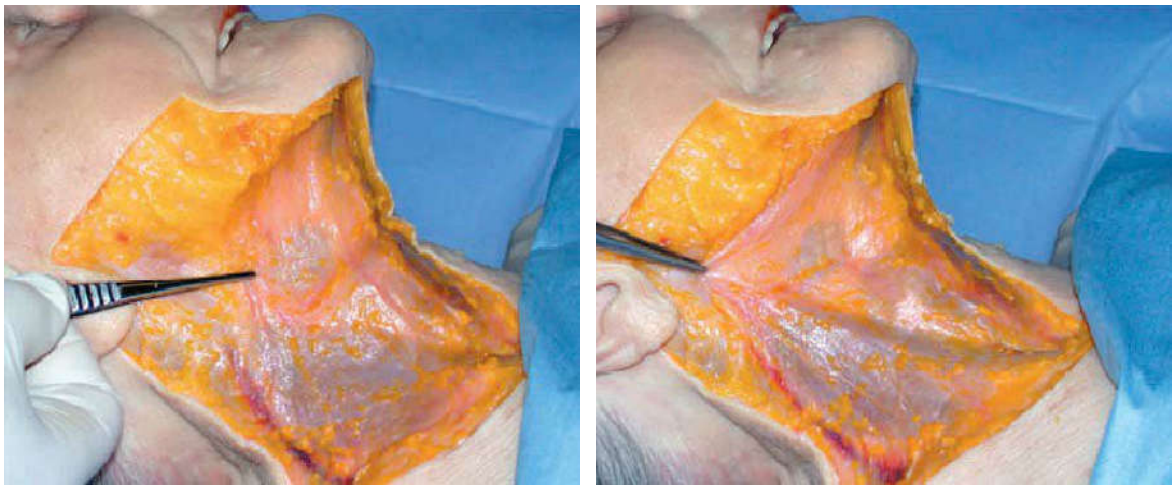
perficial fat and skin along. The SMAS and skin can be repositioned, or "gathered," because of the deeper sub-SMAS fatty layer that allows for shearing forces in more superficial layers to occur without distortion of deeper layers.

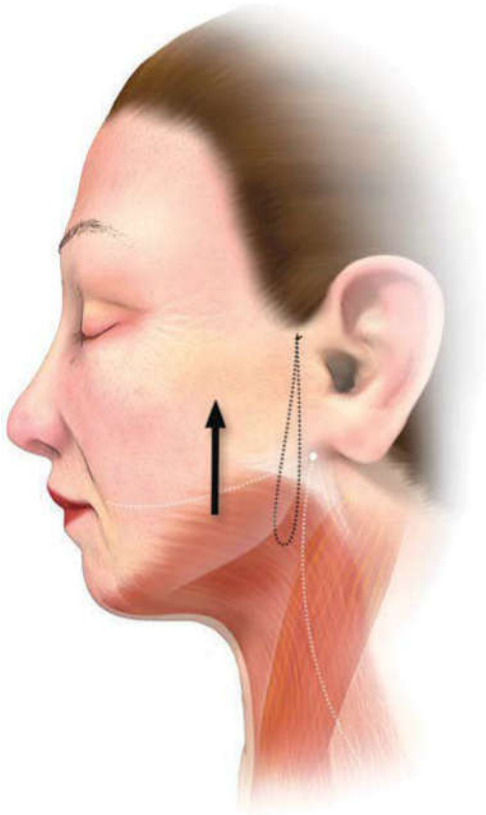
Anatomic and Biomechanical Foundations

Anatomic dissections by Mendelson point to the need for facial rejuvenation procedures to reapproximate deeper layers back to their points of fixation. His work described the anatomic pattern of ligamentous fixation of the superficial fascia to the facial skeleton that defines the boundaries that compartmentalize the face into several regions. The concept of positioning the fixation at the location of the original ligamentous fixation is quite different from that in the original SMAS surgery, when the SMAS release was discontinued before the midcheek ligaments were exposed. The SMAS fixation in that situation could only be peripheral and was under tension. Because the support of each anatomic region is attached separately to the facial skeleton at the location of the original ligamentous fixation, tension across the entire SMAS flap is avoided.

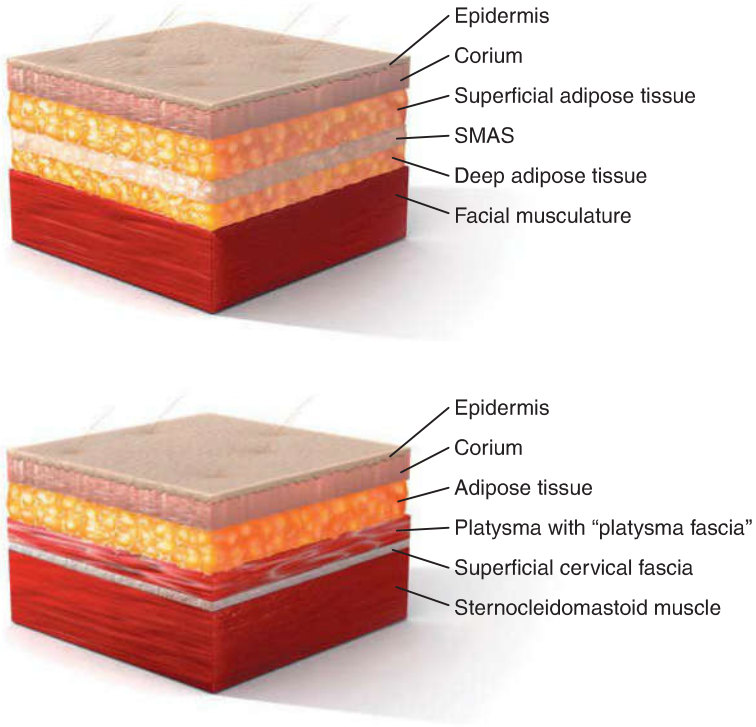
Mendelson's three anatomic regions of the face are all rejuvenated by the MACS-lift technique.

The work of Labbé and Gardetto has also contributed to the understanding of tensioning of deeper layers and the fact that the "SMAS" of the neck is actually the platysma fascia; these concepts are important in understanding the MACS-lift effect.





Labbé's anatomic dissections demonstrate that a vertical platysma pull will tighten and contour the neck.



Gardetto’s dissections show that the SMAS of the face is contiguous with the fascia of the platysma.

Articles by Mendelson, Labbé, Gardetto, and Besins have underscored the clinical and biomechanical value of short-scar face lifting as a viable choice for facial rejuvenation. Their studies suggest that the layer separation of the facial lamellae may be unnecessary to achieve volume redistribution and reapproximation of aged facial structures back to natural points of fixation. If we can attain this rejuvenative effect without deeply invasive approaches and use suture fixation loops to accomplish almost the same effect, we have advanced our ability to perform facial rejuvenation.

Consideration has been given to the matter of how gravimetric aging of the face occurs, and biomechanical engineering studies have been conducted to examine the process with a finite element modeling (FEM) approach. The MACS-lift effect also depends on specific biomechanical engineering principles regarding suture loops to shift an inelastic layer of tissue (SMAS and platysma) within the lamellae of the face and neck without the need to disintegrate the normal anatomic attachments that exist between the layers. The concept of a lamellar approach to rejuvenation surgery is not revolutionary. It has been applied to body contouring surgery by Lockwood and Avelar for years.

Historically, we have used a surgical approach that delaminates the lamellae of the face to rejuvenate it. With the MACS-lift, we are able to achieve rejuvenation by repositioning fat and deeper layers by gathering tissues that can slide as a result of the undisturbed layer of sub-SMAS fat.

The MACS-Lift of Tomorrow

Additional work is required to ascertain the volume to be redistributed in each of the three facial regions. Our techniques for MACS-lift facial rejuvenation are still imprecise and subjective, compared with using known amounts of tensioning forces on the suture loops (Newtons). Three-dimensional imaging must be considered for assessing outcomes of volume repositioning procedures rather than the two-dimensional context that currently exists. More research needs to be done to determine how to optimize the suture material used in the MACS-lift procedures and to investigate whether barbed-suture loops or mesh has a practical role to play. Applications of brow lifting with mesh have been reported.

We still lack an effective procedure for midface rejuvenation that is less invasive than the subperiosteal approaches. Ultimately, it may consist of combining the finger-assisted midface elevation (FAME) described by Aston or similar techniques that do not require orbital region skin incisions with the suture loop suspension of the extended MACS-lift.

The MACS-lift concept may also be applicable to brow ptosis. Development of a method for brow suspension without delamination of the forehead is another topic that warrants further investigation. Better outcomes from facial rejuvenation surgery will occur as we can relate the necessary amount of force (Newtons) to specific facial zones to reapproximate fat-containing layers back to their earlier points of fixation in the youthful face.

THE LEARNING CURVE FOR SHORT-SCAR RHYTIDECTOMY

Successful integration of a new surgical technique into one's practice can be challenging. It involves auditory and visual learning, bioskills, and strategies for dealing with the normal events that occur during surgery. It is a daunting task for surgical educators to transfer knowledge and a skills set to colleagues, especially when the approach is counterintuitive. It appears counterintuitive because we as surgeons are taught that we need to take something apart to repair it. In this situation, we are using biomechanical engineering to reposition tissue without the delamination that we were taught as surgeons.

Successful performance of the MACS-lift short-scar face lift demands technical excellence for the placement of suture loops and the resolution of tissue bunching that occurs once the suture loops are tightened. The MACS-lift effect is equivalent to a gathering phenomenon on the cheek and midface loops to effect volume redistribution.

INDICATIONS AND CONTRAINDICATIONS

My experience with the MACS-lift short-scar face lift on a variety of patients leads me to believe that in most cases, the short-scar approach will provide sufficient access for the accurate placement of the suture loops and tightening of the face and neck skin. Individuals with extremely loose skin in the neck and face may need extension of the incisions into the retroauricular sulcus. Otherwise, the surgeon can revert back to classic rhytidectomy incisions, with the potential downside of postauricular scar hypertrophy and diagonal traction vectors on the skin.

The best candidates for this operation are individuals with mild to moderate facial laxity who can be managed with a combined approach of surgical options that may include complementary procedures such as lipoplasty to the submental area, anterior platysmaplasty, oculoplastic surgery, brow lifting, fat grafts, nonanimal stabilized hyaluronic acid (NASHA) fillers, and neurotoxins. Additionally, a regimen of medical skin care will enhance the quality of surgical outcomes. Patients with more severe presentations of facial aging and actinic damage may require complementary use of laser resurfacing after surgery.

Contraindications are similar to those for other face-lift procedures: patients with medical problems, unrealistic expectations, psychological disorders, and life crises. Smokers have a 13-fold incidence of skin necrosis compared with nonsmokers. In my clinic, I do not operate on smokers and require a 12-week period of abstention from all nicotine-containing products.

ADVANTAGES OF MACS-LIFT SHORT-SCAR FACE LIFT

The MACS-lift provides a flexible approach to facial rejuvenation, delivering a natural outcome without the stigma of inappropriate tension vectors, flattening of the face, and the telltale sweep deformity. This technique can also reposition midface fat and address midface laxness. Lipoplasty is effective in the neck region, thereby avoiding neck dissection that separates the skin from its anatomic attachments to the underlying platysmal fascia.

The other remarkable advantage of the MACS-lift technique is that it is versatile and does not burn bridges; if the surgeon believes that he or she cannot obtain a satisfactory outcome with the MACS-lift technique, the procedure can be converted to a traditional sub-SMAS dissection with a retroauricular incision. Alternatively, the MACS-lift suture loops can be kept in place and the skin redraped according to a traditional face-lift approach. I personally have not experienced either of these situations, but offer them as backups to the short-scar approach. After performing the first 10 MACS-lift cases, the surgeon will gain an increasing comfort level with this technique and its nuances.

Planning for a Successful Outcome

For those who are new to this technique, it is advisable to begin with a relatively straightforward face lift on a patient with minimal to moderate signs of aging. Looseness in the neck, if present without significant platysma banding, is also desirable. Submental fat if present should be treated with lipoplasty. In these early cases an extended MACS-lift may be the best option to ensure an optimal result.

This patient with mild/moderate facial laxness, no evidence of fat atrophy, and adequate dermal thickness would be an ideal candidate for the MACS-lift.

COMPLEMENTARY PROCEDURES

Planning for a patient's facial rejuvenation usually involves additional complementary procedures, such as submental lipoplasty, anterior platysmaplasty, lower blepharoplasty, fillers (fat or NASHA fillers), and treatment of the brow region. It is helpful to define the sequence of procedures to be used for each patient.

OPERATIVE TECHNIQUE

Selection of Anesthesia

From the perspective of patient safety, the MACS-lift can be performed under monitored anesthesia care, local anesthesia with minimal sedation, or general anesthesia. Care should be taken to ensure that the patient is kept warm, to address deep vein thrombosis (DVT) prophylaxis, and to prevent eye dryness if general anesthesia is used.

I begin the MACS-lift facial rejuvenation with lipoplasty and anterior neck work. I start by infiltrating lipoplasty wetting solution with epinephrine 1:500,000 into the neck if lipoplasty or platysma tightening is planned. The wetting solution facilitates dissection and hemostasis.

COMPLEMENTARY PROCEDURES

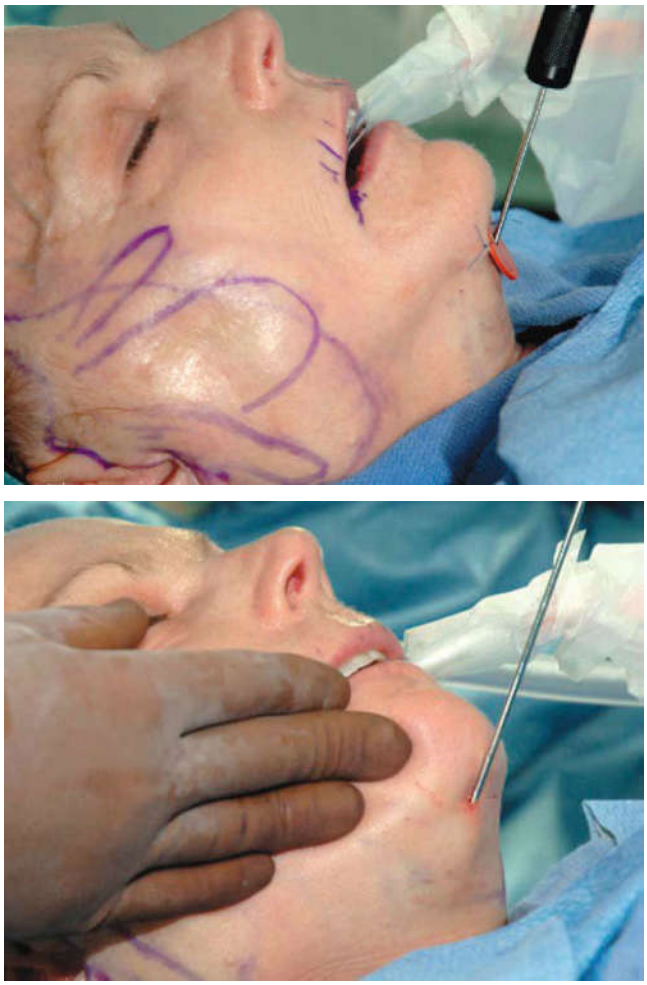
Planning for a patient's facial rejuvenation usually involves additional complementary procedures, such as submental lipoplasty, anterior platysmaplasty, lower blepharoplasty, fillers (fat or NASHA fillers), and treatment of the brow region. It is helpful to define the sequence of procedures to be used for each patient.

OPERATIVE TECHNIQUE

Selection of Anesthesia

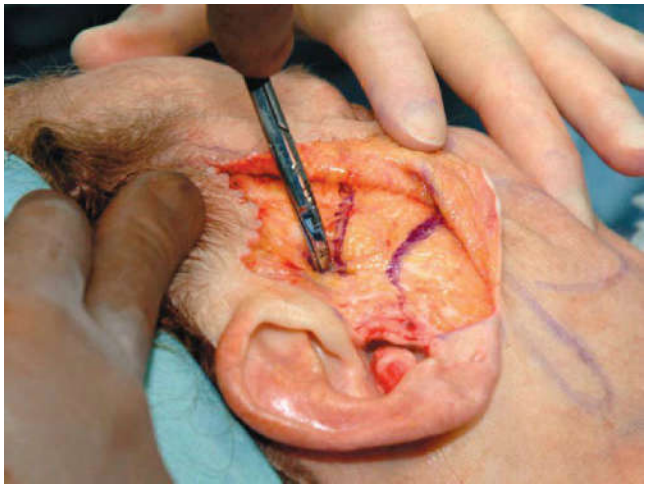
From the perspective of patient safety, the MACS-lift can be performed under monitored anesthesia care, local anesthesia with minimal sedation, or general anesthesia. Care should be taken to ensure that the patient is kept warm, to address deep vein thrombosis (DVT) prophylaxis, and to prevent eye dryness if general anesthesia is used.

I begin the MACS-lift facial rejuvenation with lipoplasty and anterior neck work. I start by infiltrating lipoplasty wetting solution with epinephrine 1:500,000 into the neck if lipoplasty or platysma tightening is planned. The wetting solution facilitates dissection and hemostasis.



Ultrasonic lipoplasty is performed on fatty deposits in the submental area. I have found the VASER ultrasonic lipoplasty device (Sound Surgical Technologies, Louisville, CO) very effective in the anterior neck and jaw line, because it allows precise and accurate removal of fat.

Next, I proceed to the short-incision rhytidectomy and flap elevation. Once this has been accomplished, I direct my attention to the neck and cheek loops of the MACS-lift. Currently, I use 0 PDS (clear) suture with a robust anchor point in the temporalis fascia, approximately 1 cm anterior to the ear.

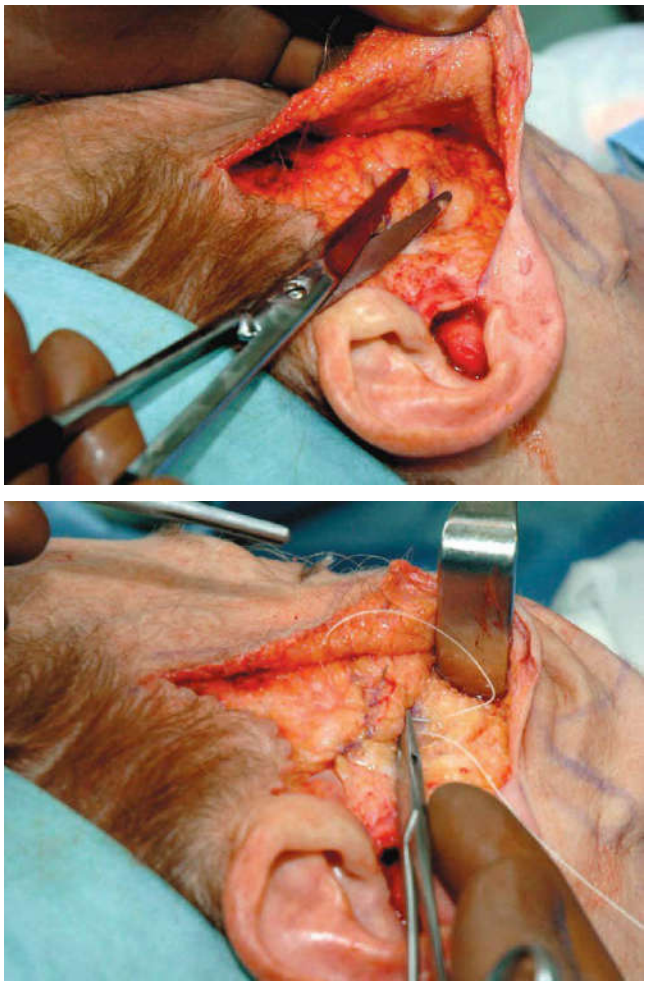


The suture suspension loops are anchored to the temporalis fascia above the zygomatic arch. Once the loops have been placed and tied, I finish with the midface loop (2-0 PDS) that is anchored approximately 1.5 cm lateral to the external canthal area. It is important, especially for the first loop in the platysma, that it be placed below the angle of the mandible with at least two suture passes into the fascia. The first loop is tightened and the knots are tied; then the second cheek loop is made without cutting the suture at the anchor point to help minimize the amount of suture material in the temporalis region and to avoid a second anchor point. Finally, the knot of the PDS suture is buried and a 4-0 Vicryl suture is placed in the overlying tissue to keep it deeply buried.

Eyelid procedures are performed at the end of the MACS-lift because there may be a significant amount of skin recruitment after the suture loops have been placed.

Managing Bunching Tissue

I then focus on resolving any residual bunching of SMAS and skin tissues. The suture loops used in the procedure will have a gathering effect on facial tissues as they are brought back up to their normal points of attachment. Although the amount of bunching that occurs can be somewhat alarming to an inexperienced surgeon, this tissue can be nicely smoothed out.

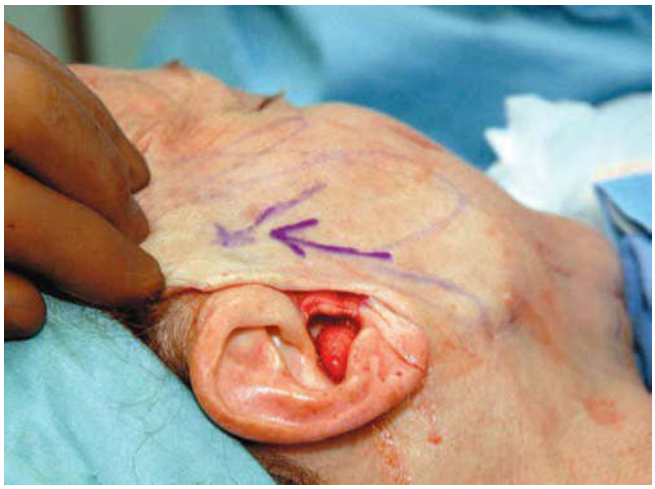


Bunching after the suture loops are tightened is normal. Depending on the amount of tissue involved, this may require trimming with the scissors *(top)* and suture insetting *(bottom)* to flatten the ridges using 4-0 Vicryl. Small skin dimples underneath the flap will require the use of the scissors to release them. However, an attempt should first be made to flatten the bunching with suture before using the scissors.

Arranging the Skin Flap and Establishing Hemostasis

Skin excess in the MACS-lift is resolved with a vertical approach. It is important to take the time to arrange the skin flap after work in the deeper layers has been completed to ensure symmetrical tension, eliminate bunching, and establish hemostasis.

Horizontal traction



Vertical traction

The efficacy of the short-scar vertical approach will become evident if the surgeon pulls the skin flap in the wrong (horizontal) direction. This horizontal traction on the skin flap will require a retroauricular incision rather than the vertical traction on the flap that resolves excess skin without the need for retroauricular dissection.

Skin is resected to avoid skin tension on the wound. This is crucial to obtain a favorable postoperative scar. Skin resection in the elevated skin is made to mirror the preauricular regional incision that you made at the start of the case. Fortunately, because of local anatomic "anchor points" the sideburn and tragal areas do not move and facilitate the closure process. A lack of facial flap tension is really important in the closure.

If the surgeon finds that there is too much loose skin remaining and worries about skin bunching in the preauricular area, it is permissible to inset the looseness behind the ear. This maneuver comes with the downside of more dissection and skin shifting to finalize the closure. If some bunching is left behind during closure, it should be located behind the earlobe, not in front.

Skin Closure

Tonnard and Verpaele use small drains placed in the area of the earlobe. I prefer to use fibrin glue (Tisseel; Baxter Healthcare, Deerfield, IL) that is diluted to 5 units/ml instead of drains. I find that fibrin glue also has the advantage of diminishing ecchymosis in the postoperative period. Fibrin glue can produce healing problems if excessive amounts are sprayed in the wound. In my experience, a 1 ml vial of Tisseel is adequate for both sides of a MACS-lift.

As discussed previously, skin closure is performed under no tension. I use 5-0 Monocryl sutures in the subdermal area to hold the wound and 5-0 and 6-0 Prolene in the skin (horizontal mattress sutures). A few 5-0 rapid-absorbing plain gut sutures can also be used. Care should be taken to remove all silk temporary sutures that were used in the planning stage of the closure. Minimal skin rippling will resolve in the postoperative period.

Eyelid and Brow-Lift Procedures

After the MACS-lift is completed, the eyelid procedures can be initiated. Because a significant amount of skin has been recruited into the orbit with the midface loop, a lower eyelid blepharoplasty will be necessary in many cases. Brow procedures, whether a lateral temporal lift or an endoscopic brow lift, can be performed in conjunction with the MACS-lift.

POSTOPERATIVE CARE

A simple dressing afterward is sufficient. I prefer silicone-backed foam that is used for lipoplasty procedures in the anterior neck to control skin wrinkling after neck lipoplasty and anterior platysma work. Foam is also helpful after endoscopic brow lift to control forehead swelling. Patients generally recover more rapidly from a MACS-lift than from a classic rhytidectomy. In most cases, swelling resolves in 10 to 14 days and the feeling of tightness in 4 weeks.

CASE EXAMPLES

Aesthetic Analysis

This 59-year-old woman requested rejuvenation of her face, lower eyelids, neck, and lips. She desired surgical improvement of her neck bands but did not want an open procedure to tighten her neck. She was healthy and did not smoke. The patient was satisfied with prior use of NASHA fillers in the lip regions and neurotoxin in the glabella and crow's-feet regions.

Surgical Plan

The treatment consisted of:

- An extended MACS-lift
- VASER lipoplasty to submental area
- A lower blepharoplasty
- 1 ml Restylane to lip lines and nasolabial folds for maintenance of existing correction

Postoperative Results

Postoperative results at 1 year show improvement in the facial laxity and volume redistribution of tissue in the cheeks and midface. The neck contour is improved, although some minor banding is still present. This is not of concern to the patient. Laxity of facial structures has been corrected with the extended MACS-lift and with the use of NASHA fillers in the lips and nasolabial area.

Aesthetic Analysis

This 54-year-old woman requested rejuvenation of her face, lower eyelids, neck, and lips. She was interested in what could be done surgically to improve her neck bands. She was healthy and did not smoke. She had a history of a successful LASIK procedure for the treatment of myopia 3 years earlier. Her tear film breakup was normal.

Surgical Plan

The treatment consisted of:

- An extended MACS-lift
- Anterior platysmaplasty with VASER lipoplasty
- A lower blepharoplasty
- 2 ml Restylane to lip lines and nasolabial folds

Postoperative Results

Improvement in the facial laxness with volume redistribution of tissue in the cheeks and midface is seen 1 year postoperatively. The neck contour has also been improved through the combination of VASER lipoplasty, anterior platysmaplasty, and the vertical pull from the MACS-lift suture. Additionally, the midface has been corrected with the extended MACS-lift and the use of NASHA fillers in the nasolabial area. The preauricular scars demonstrate excellent healing.

Surgical Pearls

- For one's initial cases, choose patients who pose fewer problems and would likely have an excellent outcome with a classic face lift.
- Develop a plan that encompasses both surgical rejuvenation through tightening of facial and neck structures and volume redistribution of fat as well as complementary nonsurgical procedures such as NASHA fillers, neurotoxins, and medical skin care.
- When placing the first suture loop to tighten the neck, make certain that the needle has a good bite of platysma fascia below the angle of the mandible. A lighted retractor is useful to help verify good fixation of the platysma.
- When placing the second loop of suture to lift the cheek, do not be tempted to make it smaller than planned preoperatively. The larger loop allows for maximal tissue gathering instead of producing a bothersome wad of cheek tissue.
- If the suture loops do not look right or the amount of gathering or correction is inadequate, cut the sutures, remove the loops, and start over. Excellent correction of laxity is needed, with secure reattachment of tissue back to its original point of adherence. If correction is suboptimal, take the time to achieve optimal correction.
- Finesse in controlling bunching and skin dimpling is essential to achieving a smooth contour. Devote the necessary time to smooth the contours. It can be helpful to drape the skin flap over the lifted tissue and look for visible or palpable contour irregularities.
- Skin wrinkling in the inferior ear will generally improve with time. It is permissible to go behind the ear slightly to inset skin, if necessary, to control significant wrinkling, just as you would if there were a dog-ear at the end of a wound closure.
- Excessive dissection should be avoided in the retroauricular area or on the surface of the sternocleidomastoid muscle. Both of these are natural areas of adherence between skin and deeper structures and represent inferior anchor points to the vertical lift with the suture loops.
- Consider the use of the silicone-coated foam that is used in lipoplasty as a dressing to help control swelling in the cheeks and anterior neck, especially after lipoplasty or open anterior platysmaplasty.
- Wideness in the area of the sternocleidomastoid muscle, apparently caused by tension from the first vertical loop, resolves in a few days after surgery.

BIBLIOGRAPHY

Avelar J. Regional distribution and behavior of the subcutaneous tissue concerning selection and indication for liposuction. Aesthetic Plast Surg 13:155-165, 1989.

Baker DC. Deep dissection rhytidectomy: A plea for caution. Plast Reconstr Surg 93: 1498-1499, 1994.

Baker DC. Face lift with submandibular gland and digastric muscle resection: Radical neck rhytidectomy. Aesthetic Surg J 26:85-92, 2006.

Baker DC. Lateral SMASectomy. Plast Reconstr Surg 100:509-513, 1997.

Besins T. The "R.A.R.E." technique (reverse and repositioning effect): The renaissance of the aging face and neck [review]. Aesthetic Plast Surg 28:127-142, 2004. Epub 2004, Aug 3.

Gardetto A, Dabernig J, Rainer C, et al. Does a superficial musculoaponeurotic system exist in the face and neck? An anatomical study by the tissue plastination technique. Plast Reconstr Surg 111:664-672, 2003.

Labbé D, Franco RG, Nicolas J. Platysma suspension and platysmaplasty during neck lift: Anatomical study and analysis of 30 cases. Plast Reconstr Surg 117:2001-2007, 2006.

Lockwood T, Baroudi R. Lower body lift with superficial fascial system suspension. Plast Reconstr Surg 92:1123-1125, 1993.

Matarasso SL, Carruthers JD, Jewell ML; Restylane Consensus Group. Consensus recommendations for soft-tissue augmentation with nonanimal stabilized hyaluronic acid (Restylane). Plast Reconstr Surg 117(3 Suppl):3S-34S, 2006.

Mazza E, Papes O, Rubin MB, et al. Nonlinear elastic-viscoplastic constitutive equations for aging facial tissues. Biomech Model Mechanobiol 4:178-189, 2005. Epub 2005, Aug 12.

Mendelson BC. Surgery of the superficial musculoaponeurotic system: Principles of release, vectors, and fixation. Plast Reconstr Surg 107:1545-1552, 2001.

Moss CJ, Mendelson B, Taylor GI. Surgical anatomy of the ligamentous attachments in the temple and periorbital regions. Plast Reconstr Surg 105:1475-1490, 2000.

Mutaf M. Mesh lift: A new procedure for long-lasting results in brow lift surgery. Plast Reconstr Surg 116:1490-1499, 2005.

Rees TD, Liverett DM, Guy CL. The effect of cigarette smoking on skin-flap survival in the face lift patient. Plast Reconstr Surg 73:911-915, 1984.

Ruff G. Technique and uses for absorbable barbed sutures. Aesthetic Surg J 26:620-628, 2006.

Tebbetts J. Achieving a zero percent reoperation rate at 3 years in a 50-consecutive-case augmentation mammaplasty premarket approval study. Plast Reconstr Surg 118: 1453-1457, 2006.

Tebbetts J, Adams W. Five critical decisions in breast augmentation using five measurements in 5 minutes: The high five decision support process. Plast Reconstr Surg 118(7 Suppl):35S-45S, 2006.

Tonnard PL, Verpaele AM. The MACS-Lift Short-Scar Rhytidectomy. St Louis: Quality Medical Publishing, 2004.

Tonnard P, Verpaele A, Monstrey S, et al. Minimal access cranial suspension lift: A modified S-lift. Plast Reconstr Surg 109:2074-2086, 2002.

Winkler E, Goldan O, Regev E, et al. Stensen duct rupture (sialocele) and other complications of the Aptos thread technique. Plast Reconstr Surg 118:1468-1471, 2006.

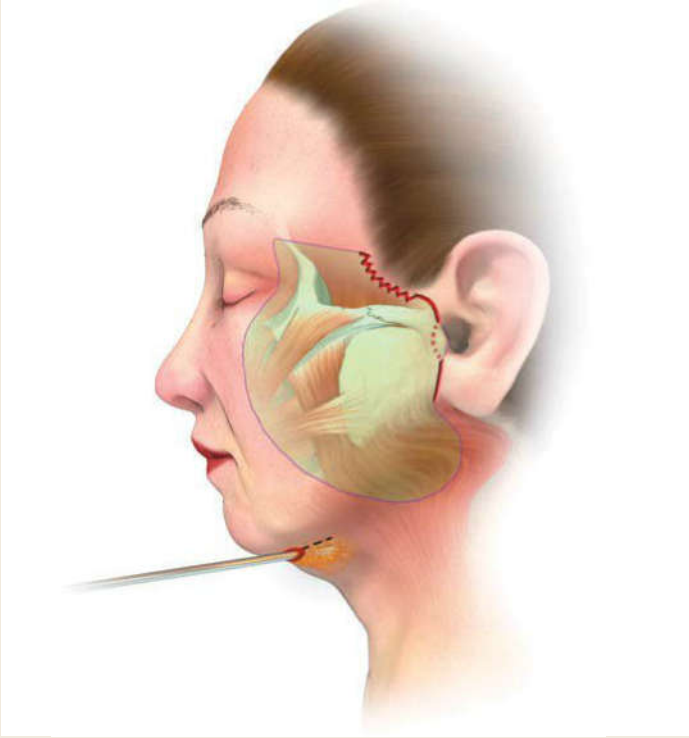
Chapter

6

Short-Scar Face Lift

Evolution and Applications

Daniel C. Baker



RHYTIDECTOMY IN THE TWENTIETH CENTURY

Rhytidectomy is a procedure that continues to evolve as surgeons seek to offer patients natural rejuvenation with reduced morbidity. Over the years I have witnessed an evolution of techniques ranging from basic skin lifts to superficial musculoaponeurotic system (SMAS) procedures to even more complex deep-plane operations.

Friedland has divided the history of rhytidectomy in the twentieth century into four generations, beginning with simple skin lifts and ending with deep-dissection, more radical techniques.

First Generation: Up to World War II

- Skin lift only
- Subcutaneous dissection, variable undermining

Second Generation: 1950s to 1975

- Subcutaneous dissection, superficial plication, skin lift

In 1968, John Conley best summarized the plication technique in his book, *Face-Lift Operation,* as follows:

1. Plication is done in long thin faces with a paucity of subcutaneous tissue.
2. The subcutaneous tissue in the cheek is plicated inferior to the zygomatic arch.
3. Imbricate the central part in hollow sunken cheeks to obtain fullness.

However, Rees emphasized that the effectiveness of plication was a great point of controversy among plastic surgeons. Tipton's paper in 1974, demonstrating no difference between the plicated and nonplicated side, convinced many plastic surgeons to abandon plication techniques in face lifting. When SMAS dissection became popular after the work of Mitz and Peyronie was published in 1976, it became routine to include a dissection of the lateral SMAS directly overlying the parotid gland. This led to the next generation.

Third Generation: 1970s to 1980s

- Subcutaneous dissection, more extensive defatting
- SMAS and platysma flaps

My first experience with rhytidectomy was during my plastic surgery residency in the late 1970s. At that time, a combination of extensive defatting of the neck with complete platysma muscle transaction, plicating medial borders, and pulling laterally was presented as the only way to get the best result. Years of patient complaints, complications, and overoperated necks occurred before I abandoned this approach.

I performed SMAS dissection in the late 1970s and continued to do so into the mid-1980s, but overall I was disappointed with the effects of a simple elevation and tightening of the lateral superficial fascia. Specifically, I saw little difference in overall facial contour, regardless of whether I had performed a lateral SMAS dissection.

As I gained more experience with SMAS dissection, it became obvious that for the superficial fascia to produce any effective change in facial contour, it was necessary to elevate the mobile SMAS anterior to the parotid gland. The problem with this more extensive SMAS dissection is that facial nerve branches are placed in greater jeopardy. I also noted that the superficial fascia tends to thin out as it is dissected more anteriorly, making it easier for the SMAS to tear. All too often, I would note thinning and tears after elevating a SMAS flap. Any significant tension placed on the SMAS flap in suturing would result in further tears. For this reason, I concluded that an extensive SMAS dissection was not warranted in most patients and offered little long-term benefit compared with SMAS plication.

Because of disappointment with longevity and improvement of the midface and nasolabial folds, the techniques became more invasive leading to the next generation.

Fourth Generation: 1990s

- Composite rhytidectomy
- Subperiosteal lifts
- Subplatysma surgery

During the 1990s, presentations on deep dissection rhytidectomies, subperiosteal lifts, and endoscopic approaches attested to the splendor of creative surgery. The contribution of these approaches is already evident: an increased and clearer knowledge of facial anatomy, muscle function, and human expression. Some aspects of these techniques have been incorporated by many plastic surgeons. What remains to be answered is: (1) What are the indications for these deep techniques? (2) How great are the risks and complications? (3) Most important, do the benefits of these techniques outweigh their risks significantly enough to justify using them routinely?

Lateral SMASectomy

In 1992, I discovered the benefits of the lateral SMASectomy as an alternative to formally elevating the superficial fascia. With this approach, a portion of the SMAS is removed in the region directly overlying the anterior edge of the parotid gland. Excision of the superficial fascia in this region secures the mobile anterior SMAS to the fixed portion of the superficial fascia overlying the parotid. The SMASectomy is performed in a direction parallel to the nasolabial fold to ensure that the vectors of elevation after SMAS closure will lie perpendicular to the nasolabial fold, thereby producing improvement in this fold as well as in the jowl and jawline.

Identical Twin Study

In 1995, a live surgical teaching course was held in San Francisco with four different surgeons (Baker, Hamra, Owsley, and Ramirez) operating on two sets of identical twins, with each surgeon using a different technique. Follow-up at 1, 6, and 10 years demonstrated no significant difference in results and longevity.

Resurgence of Plication Techniques

In the mid-1990s, there were a number of face-lift articles with large series reporting on the benefits and success of SMAS plication only (Friedland 750 cases, Pitanguy 8000 cases, and Robbins 4000 cases). These experienced surgeons felt there was no difference in the results with more invasive techniques.

Why Did Plication Fall Out of Favor With Many Plastic Surgeons?

- Sutures were too superficial (subcutaneous fat) out of fear of facial nerve injury.
- The vectors were incorrect.
- The sutures were too fine.
- The sutures were too few.

Although the debate continues about which rhytidectomy technique yields the best results, no single technique is best. Most techniques are variations on a basic theme. What has clearly evolved in the twenty-first century is the trend to less-invasive procedures with low morbidity, short recovery, and minimal scars. That most patients are happy with the simpler techniques is obvious.

The fact that the deeply invasive, more radical techniques do not produce appreciably better results has motivated most plastic surgeons around the world to rely on the less-complicated standard techniques.

Each surgeon must adopt a technique that serves his or her patients well and ideally is safe, consistent, and applicable to a variety of anatomic problems.

RHYTIDECTOMY IN THE TWENTY-FIRST CENTURY

In the twenty-first century, rhytidectomy has advanced to the next generation with minimally invasive short-scar techniques.

Fifth Generation

- Subcutaneous undermining, SMAS treatment (plication, SMASectomy)
- Short-scar, S-lift, MACS-lift
- Suspension sutures
- Fat grafting and fillers

Short-Scar Rhytidectomy

The short-scar rhytidectomy was developed out of the demands of younger female patients (mostly in their forties) who sought facial rejuvenation but were adamantly opposed to any scarring behind the ears. These patients objected to the posterior hairline distortion, hypertrophic scars, and hypopigmentation that they often observed in their friends or mothers who had undergone face lifts. They were embarrassed to wear their hair up or in a ponytail with such scars visible.

I performed my first short-scar rhytidectomy in 1990. The patient was 41 years old and had submental and submandibular fat and early jowls but good cervical skin elasticity. I performed liposuction of the neck and jowls with wide subcutaneous skin undermining in the face, detaching the malar and masseterocutaneous ligaments. A pure skin lift was done with no retroauricular scars. The result was superb, and I incorporated this procedure for all my younger patients with similar anatomies.

In 1992 I began to add the lateral SMASectomy technique to the face-lift operation for young women in their forties. However, I noticed that vertical elevation of the face also affects the cervical skin to some degree; lax cervical skin was also tightened because the soft tissues of the face and neck are linked anatomically. Between 1990 and 1998, 209 young female patients underwent this operation without retroauricular scars.

As I became more confident about the results and the operation, I began to perform it in older patients with more progressive jowling and cervical laxity. In these patients, it was necessary to undermine further in the neck and over the sternomastoid and submandibular regions. This exposed the platysma muscle in the neck, which enabled resection of the posterior muscle continuous with the SMASectomy. By resecting platysma over the tail of the parotid gland and anterior border of the sternocleidomastoid, the facial nerves were protected and the platysma could be tightened with a lateral vector.

Between 1999 and 2005, I performed 1736 short-scar rhytidectomies with lateral SMASectomy or plication. Patients ranged in age from 40 to 74 years, all with a variety of facial aging signs and neck deformities. I now believe that the technique has progressed to the point where I can say that it is reliable, as safe as the other procedures, and should be reproducible for most plastic surgeons. In general, it produces consistent results in properly selected patients.

The primary advantage of short-scar rhytidectomy is that it allows patients who wear their hair pulled up or back to do so. Any retroauricular scarring or disruption of the posterior hairline makes these patients unhappy. In addition, the operation involves less dissection and is less invasive; presumably this causes less pain and results in a shorter healing time. In patients who develop hematomas, evacuation is easier with less morbidity.

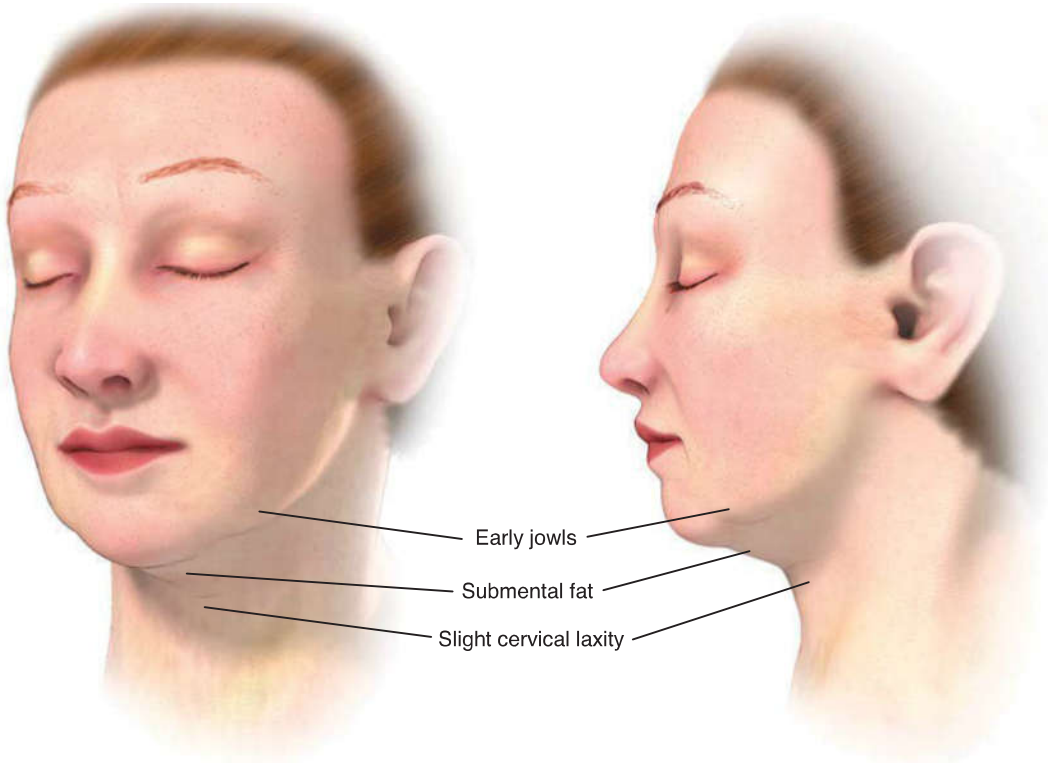
There are disadvantages as well. This technique is not suitable for all patients, especially those with severe cervical skin laxity. Because a significant vertical lift is required, strict attention must be paid to minimizing temporal hairline shifts. In certain patients an anterior hairline incision must be used. Fitting dog-ears into the temporal and earlobe areas can be a challenge, and these areas take more time to soften and flatten. Exposure of the neck with the short-scar technique is limited, making the operation technically more difficult.

I do not use this technique in every patient. Patients with severe cervicofacial laxity and loss of elasticity benefit more from classic rhytidectomy operations with retroauricular scars.

TYPES OF CANDIDATES

Based on my surgical experience with this procedure, I have classified candidates into the following four types.

Type I: The Ideal Candidate (Early to Late Forties)

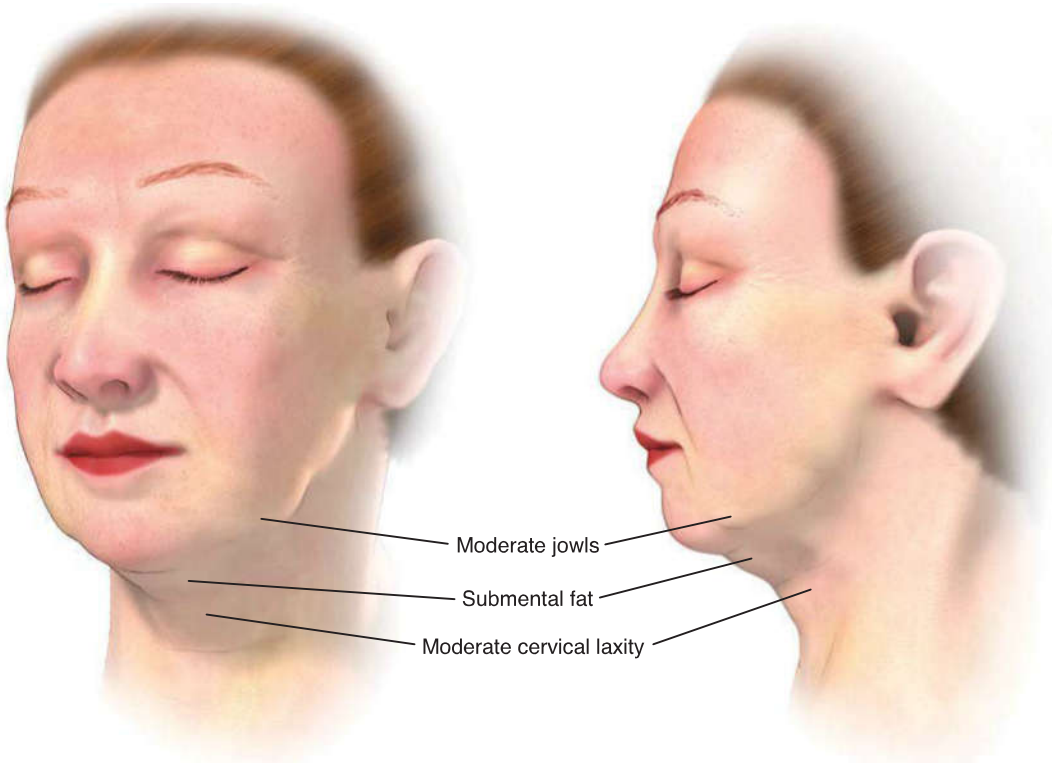


Characteristics	Surgical Plan
Age early to late forties	Suction-assisted lipoplasty (neck)
Aging primarily facial	SMASectomy
Early jowling	Plication only in a thin face
Slight cervical skin laxity	Chin implant if indicated
May have submental fat	
May have microgenia	
Good cervical skin elasticity	

Ideal candidates for a short-scar rhytidectomy are usually in their early to late forties, with aging primarily in the face. Although they may have slight cervical laxity, skin elasticity is still good. They have early jowling and often submental and submandibular fat. Microgenia may also be present.

These patients are effectively treated with closed lipoplasty of the neck and jowls, wide subcutaneous skin undermining, and lateral SMASectomy or plication with or without platysma resection. No retroauricular incision is necessary to improve the neck and face. If indicated, a chin implant enhances the result.

Type II: The Good Candidate (Late Forties to Late Fifties)

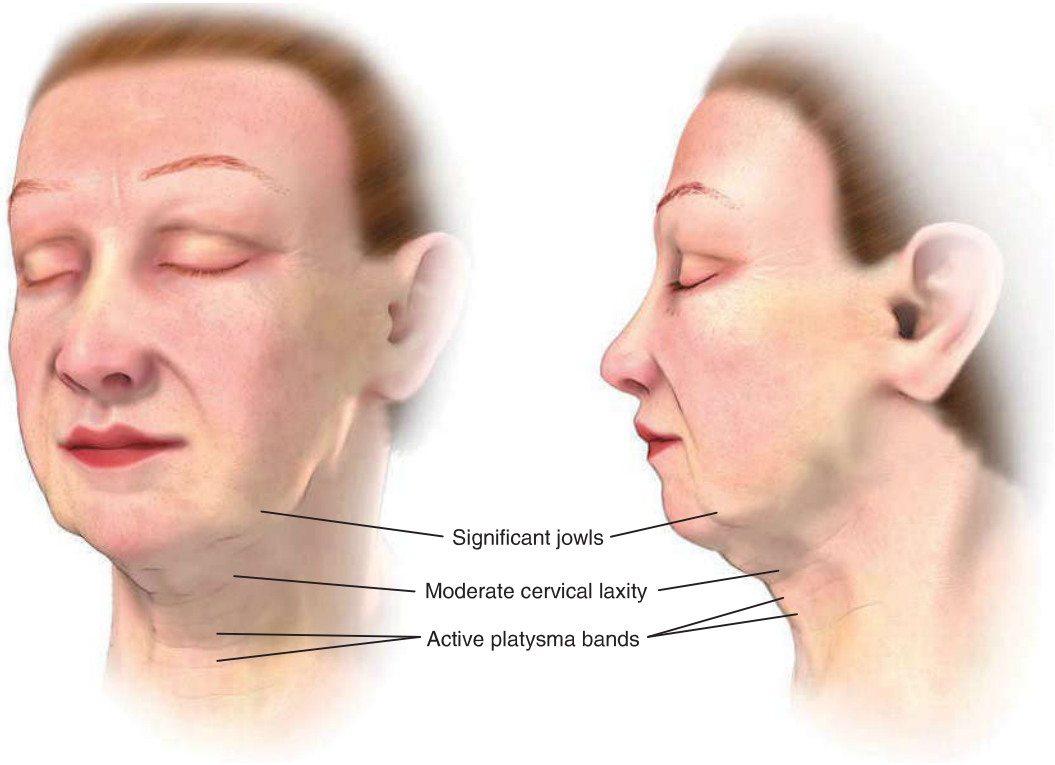


Characteristics	Surgical Plan
Age late forties to late fifties	Suction-assisted lipoplasty (neck)
Moderate jowls	SMASectomy
Moderate cervical skin laxity	Plication only in a thin face
Submental/submandibular fat	Chin implant if indicated
May have microgenia	
No active platysma bands	

Good candidates are usually in their late forties to late fifties with moderate jowling and cervical skin laxity. Submandibular and submental fat is usually present, and they may have microgenia. Medial platysma bands are not present on normal animation. (I do not evaluate the platysma on forced animation or on the basis of static photographs; often what may appear to be significant platysma bands represents laxity only, which can be corrected with a lateral pull.)

Closed lipoplasty of the neck and jowls along with lateral SMASectomy and platysma resection produce a good result in these patients. If indicated, a chin implant will enhance the result. Usually a retroauricular incision is not required. However, if a dog-ear is present at the ear lobe, it can be corrected with a short retroauricular incision.

Type III: The Fair Candidate (Late Fifties, Sixties, Early Seventies)

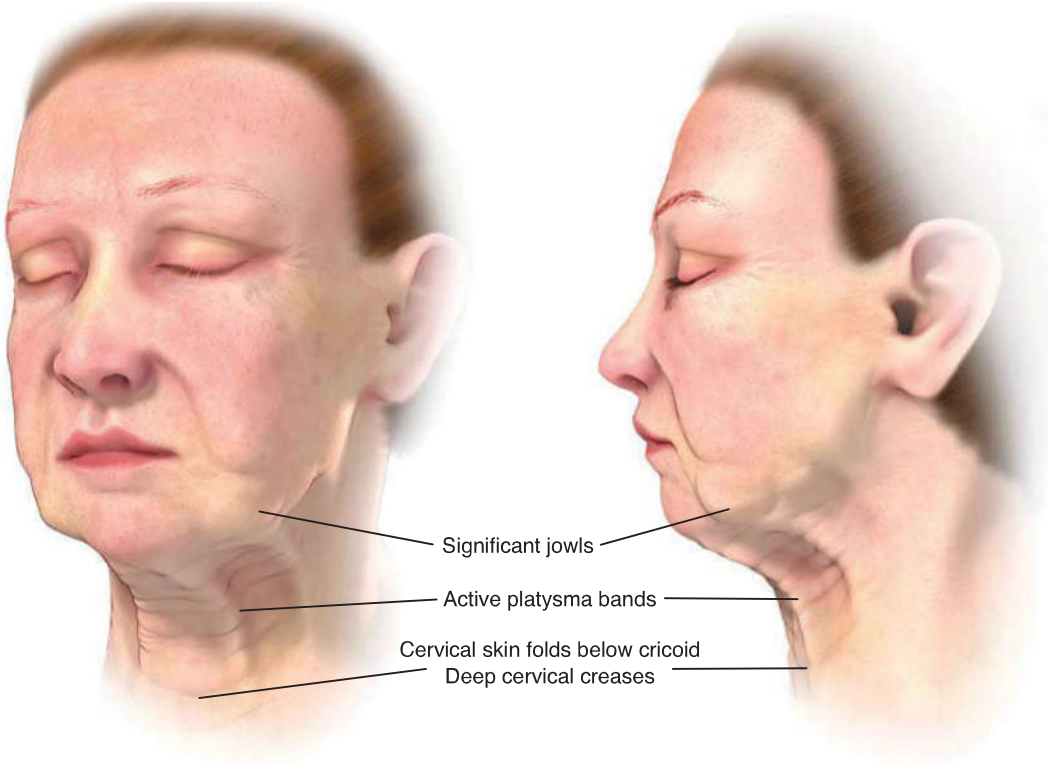


Characteristics	Surgical Plan
Age late fifties, sixties, or early seventies	Open submental suction-assisted lipoplasty
Significant jowls	Platysma approximation at hyoid with corset or wedge excision
Moderate cervical skin laxity	SMASectomy/platysma resection or plication (thin face)
Submental/mandibular fat	Removal of dog-ear in retroauricular sulcus
Platysma bands on animation	Chin implant if indicated
May have microgenia	
Some secondary rhytidectomy	

Fair candidates are usually in their late fifties, sixties, or early seventies. They exhibit significant jowling, moderate cervical laxity, and submental and submandibular fat. Significant medial platysma bands, active on natural animation, may also be present.

The approach to type III patients is via an open submental incision connecting subcutaneous undermining with the face and lateral neck. Open lipoplasty of submental and submandibular fat is performed to expose the platysma muscle. A 4 to 5 cm wedge of platysma is removed at the level of the hyoid. The medial borders of the platysma muscle are approximated to define the cervicomental angle. Lateral suturing of the platysma to the mastoid periosteum enhances the jawline. If redundant skin is present at the ear lobe after redraping, it can be removed with a short retroauricular incision.

Type IV: The Poor Candidate (Sixties and Seventies)



Characteristics	Surgical Plan
Age late sixties and seventies	A significant compromise
Significant jowls	Open submental suction-assisted lipoplasty
Poor cervical skin laxity	Platysma approximation at hyoid with wedge excision
Skin folds below cricoid	SMASectomy/platysma resection or plication
Submental/submandibular fat	Removal of dog-ear in retroauricular sulcus
Platysma bands on animation	Chin implant if indicated
Deep cervical creases	Requires more extensive undermining for skin redraping Retroauricular incision can always be extended

Poor candidates are usually in their sixties and seventies, with significant jowling and active, lax platysma bands. Skin folds and deep creases below the cricoid cartilage are often present, and cervical skin elasticity is poor. Although these patients are not good candidates for short-scar rhytidectomy, this operation can be offered to them as a compromise solution that keeps open the option of extending the retroauricular incision if necessary. Laterally and posteriorly, it is usually necessary to undermine over the mastoid and sternocleidomastoid muscle to obtain proper skin redraping. Excess cervical skin must be tailored into the retroauricular sulcus.

Table 6-1 Evolution of the Short-Scar Rhytidectomy

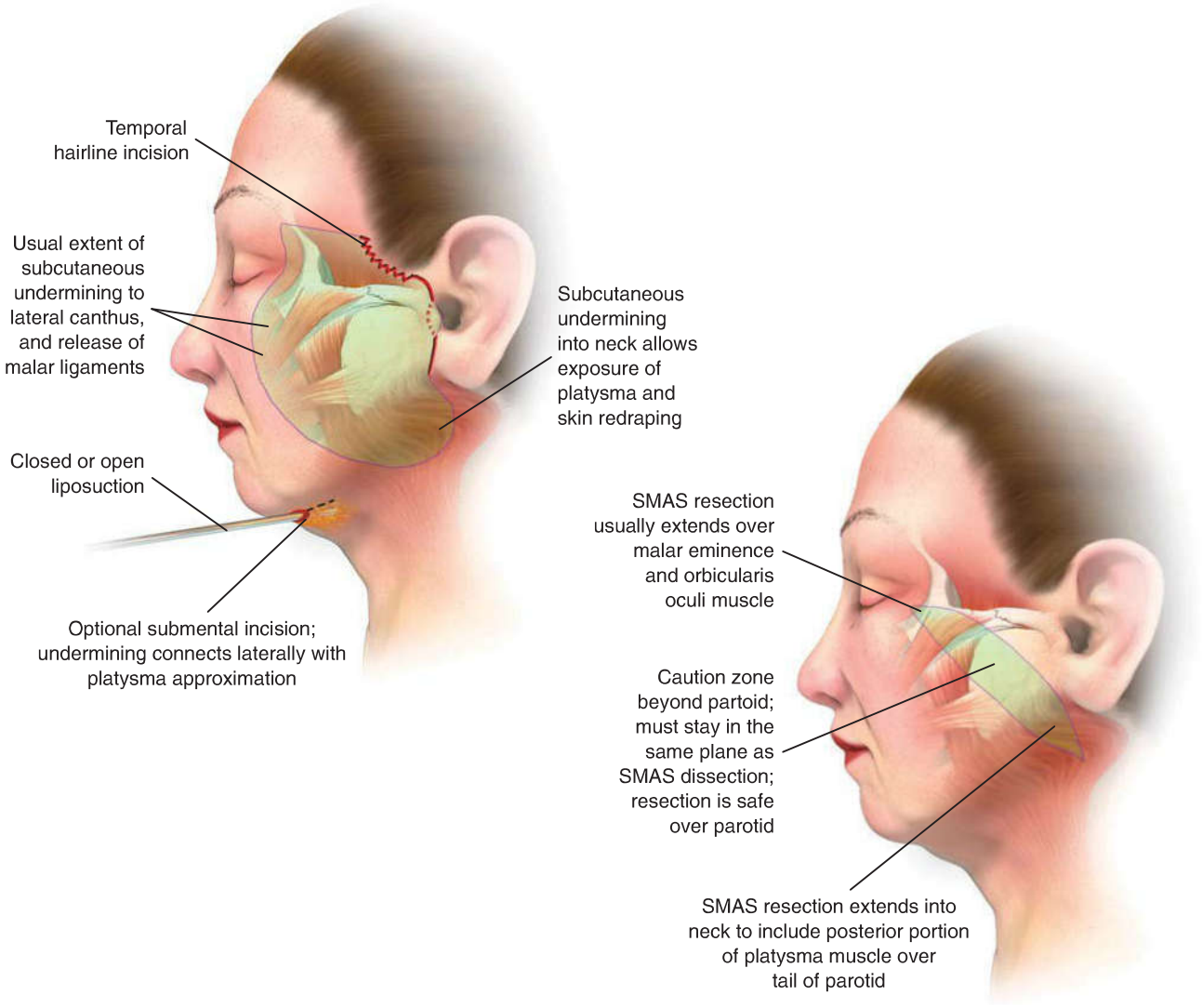
	Patients	Procedure/Skin Type
1990	1	Skin lift only
1991	4	SAL neck
1992	3	
1993	12	All type I patients
1994	15	Plication or SMASectomy
1995	35	All types I and II
1996	44	Closed SAL (neck)
1997	45	Plication or SMASectomy
1998	50	No platysma work
1999	245	Types I, II, III, and IV
2000	275	Closed suction-assisted lipoplasty (neck) or open
2001	257	Plication or SMASectomy
		Submental platysmaplasty
2002	243	Majority types I, II, and III
2003	236	More plication and imbrication
2004	249	SMASectomy for debulking
2005	231	
TOTAL	2345	

Operative Overview

LATERAL SMASECTOMY INCLUDING PLATYSMA RESECTION

The reapproximation after SMAS resection is usually done with interrupted, buried 2-0 and 3-0 PDS sutures placed in a vertical direction and perpendicular to the nasolabial folds. Plication is usually done with interrupted sutures, although in some cases a running closure is more efficient.

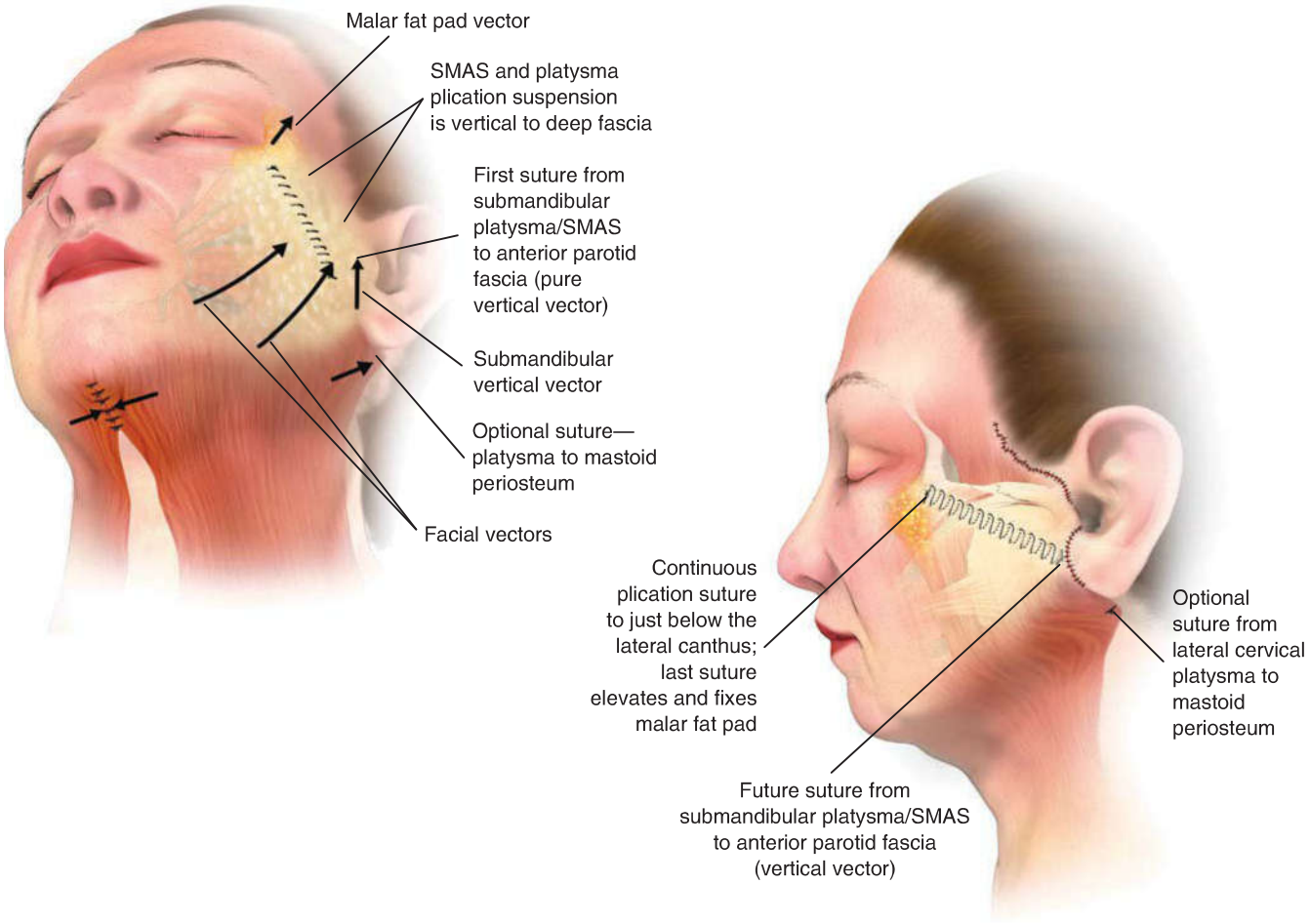
In the SMAS-platysma resection, the level of resection is superficial to the parotid masseteric fascia that overlies the facial nerve branches. The outline of the SMASectomy is marked on a tangent from the lateral malar eminence to the angle of the mandible, essentially in the region along the anterior edge of the parotid gland. In most patients this involves a line of resection extending from the lateral aspect of the malar eminence toward the tail of the parotid gland. Frequently, orbicularis oculi muscle fibers are exposed at the superior



limit of the excision, which must extend over the malar eminence to elevate the fat pad. Usually a 2 to 4 cm segment of superficial fascia is excised, depending on the degree of SMAS-platysma laxity.

It is important to emphasize that *in patients with thin faces, SMASectomy is not performed*. Instead, plication and imbrication are designed to recontour and augment the face.

In SMAS resection, I like to pick up the superficial fascia in the region of the tail of the parotid gland, extending the resection from inferior to superior in a controlled fashion. When SMAS resection is being performed, it is important to keep the dissection superficial to the deep fascia and avoid dissection into the parotid parenchyma. The size of the parotid gland varies from patient to patient; consequently, the amount of protection for the underlying facial nerve branches will also vary. Despite this, as long as the dissection is carried superficial to the deep facial fascia, ensuring that only the superficial fascia is resected, facial nerve injury as well as parotid injury will be prevented. In essence, this is a resection of the superficial fascia in the same plane of dissection in which one would normally raise a SMAS flap.



RESULTS

In my experience with performing more than 2000 short-scar rhytidectomies in properly selected patients (types I and II), the results and longevity are similar to my classic rhytidectomy. Complications are similar to those of other published rhytidectomy series.

Complications of the Short-Scar Face Lift

Hematoma	1.5%
Facial paralysis (all resolved in 2 months)	0.3%
Infection (abscess)	0.8%
Skin slough (minor)	1.0%
Hypertrophic scars	2.0%
Suture granuloma (PDS)	3.5%
Ear lobe deformity	0.8%
Retroauricular pleating	2.0%

After going through a period of trying the short-scar approach on almost all types of patients, I have learned the limitations of the technique. Now, rather than compromising the result, I do not perform short-scar rhytidectomies on type IV patients and many type III patients. Male patients usually present at a later age for rhytidectomy, with more cervical laxity, and very few are candidates for the short-scar technique.

Limitations of the Short-Scar Face Lift

Best for type I and II patients
Earlier neck relaxation on type III and IV patients
More ear lobe scar revisions on type III and IV patients
Rarely applicable for males

CASE EXAMPLES

Short-Scar Face Lift for the Type I Patient—Plication Only

Aesthetic Analysis

This 48-year-old woman had early jowls and cervicofacial laxity. Her face was thin and body fat low. At work she always wore her hair in a ponytail and was greatly concerned about retroauricular scars and posterior hairline disruption. Her presentation made her a type I ("ideal") candidate for short-scar rhytidectomy. Her thin face and hollow cheeks were best treated with plication and imbrication to augment and recontour her face.

Surgical Plan

The treatment consisted of:

- Local anesthesia with intravenous propofol
- Simple short-scar face lift with plication of SMAS and platysma
- No liposuction or removal of fat
- No submental work

Postoperative Results

The patient's 1-year postoperative results demonstrate an overall change in facial shape to oval, with correction of jowls and midface and enhancement of cheek bones. The lateral view shows neck correction with preservation of the hairline and imperceptible scars.

Short-Scar Face Lift for the Type II Patient—Plication Only

Aesthetic Analysis

This 55-year-old woman had moderate jowling and cervicofacial laxity with minimal submental fat. Excess skin and fat of the upper and lower eyelids was present. She represented a type II ("good") candidate for short-scar rhytidectomy. To maintain facial fat and restore facial fullness, a plication of the SMAS and platysma was performed.

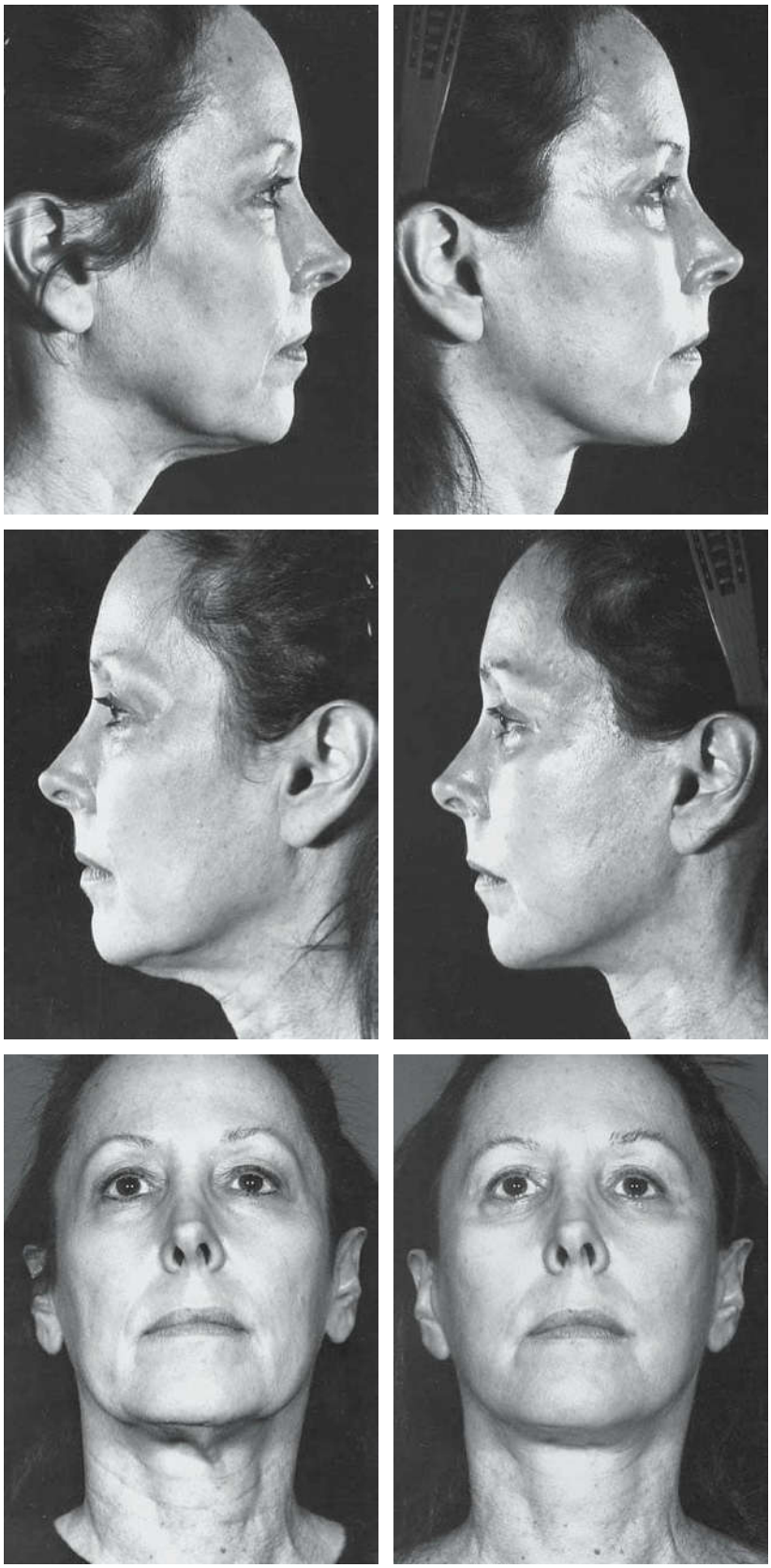
Surgical Plan

The treatment consisted of:

- Local anesthesia with intravenous propofol
- Upper and lower blepharoplasty
- Simple short-scar face lift with plication of the SMAS and platysma
- Conservative closed-neck liposuction

Postoperative Results

The patient's 1-year postoperative result demonstrates reestablishment of a youthful, oval facial shape, enhancement of the submalar region and cheek bones, and correction of oral commissures. The lateral view demonstrates correction of the cervical laxity and jawline with preservation of the hairline.



Short-Scar Face Lift for the Type III Patient—SMASectomy

Aesthetic Analysis

This 59-year-old woman had significant jowls and cervicofacial laxity with microgenia. She had excess skin and fat of her upper eyelids and represented a type III ("fair") candidate for short-scar rhytidectomy. A lateral SMASectomy was performed to reduce jowl and cheek fullness. An upper blepharoplasty was also performed and a chin implant placed.

Surgical Plan

The treatment consisted of:

- Local anesthesia with intravenous propofol
- Open-neck liposuction and approximation of the medial platysma
- Lateral SMASectomy
- Chin augmentation with a Silastic implant

Postoperative Results

The patient's 1-year postoperative results demonstrate improvement in the facial shape and midface with enhancement of the cheek bones. Neck improvement resulted from midline platysma approximation and a chin implant. No subplatysmal work was done. It is important to note that rhytidectomy cannot eliminate deep rhytids from the commissures/jowl area.

Short-Scar Face Lift for the Type III Patient—SMASectomy

Aesthetic Analysis

This 53-year-old woman had always had submental fullness and lack of cervicomental definition. She represented a type III ("fair") candidate for short-scar rhytidectomy.

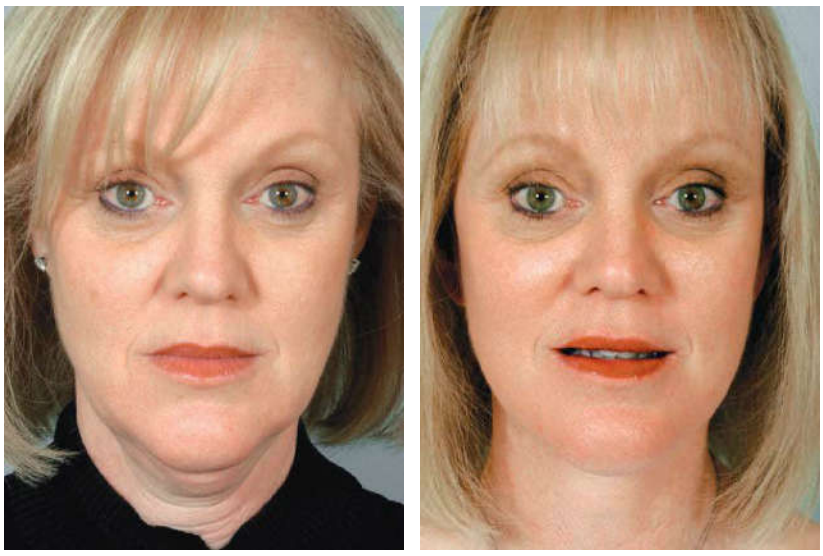
Surgical Plan

The treatment consisted of:

- Local anesthesia with intravenous propofol
- Open-neck liposuction and approximation of the medial platysma
- Lateral SMASectomy to reduce facial fullness and jowls

Postoperative Results

The patient's 1-year postoperative results demonstrate improvement in the neck and jowls and reshaping of the face. Despite the fact that no subplatysmal work was done, the lateral view demonstrates overresection of subcutaneous fat leaving a slight submental hollow and prominent ptotic chin.



Short-Scar Face Lift for the Type IV Patient

Aesthetic Analysis

This 60-year-old woman demonstrated cervical laxity below the cricoid extending to the sternal notch. She was a "poor" candidate for a short-scar face lift, which would have compromised the improvement of her cervical laxity.

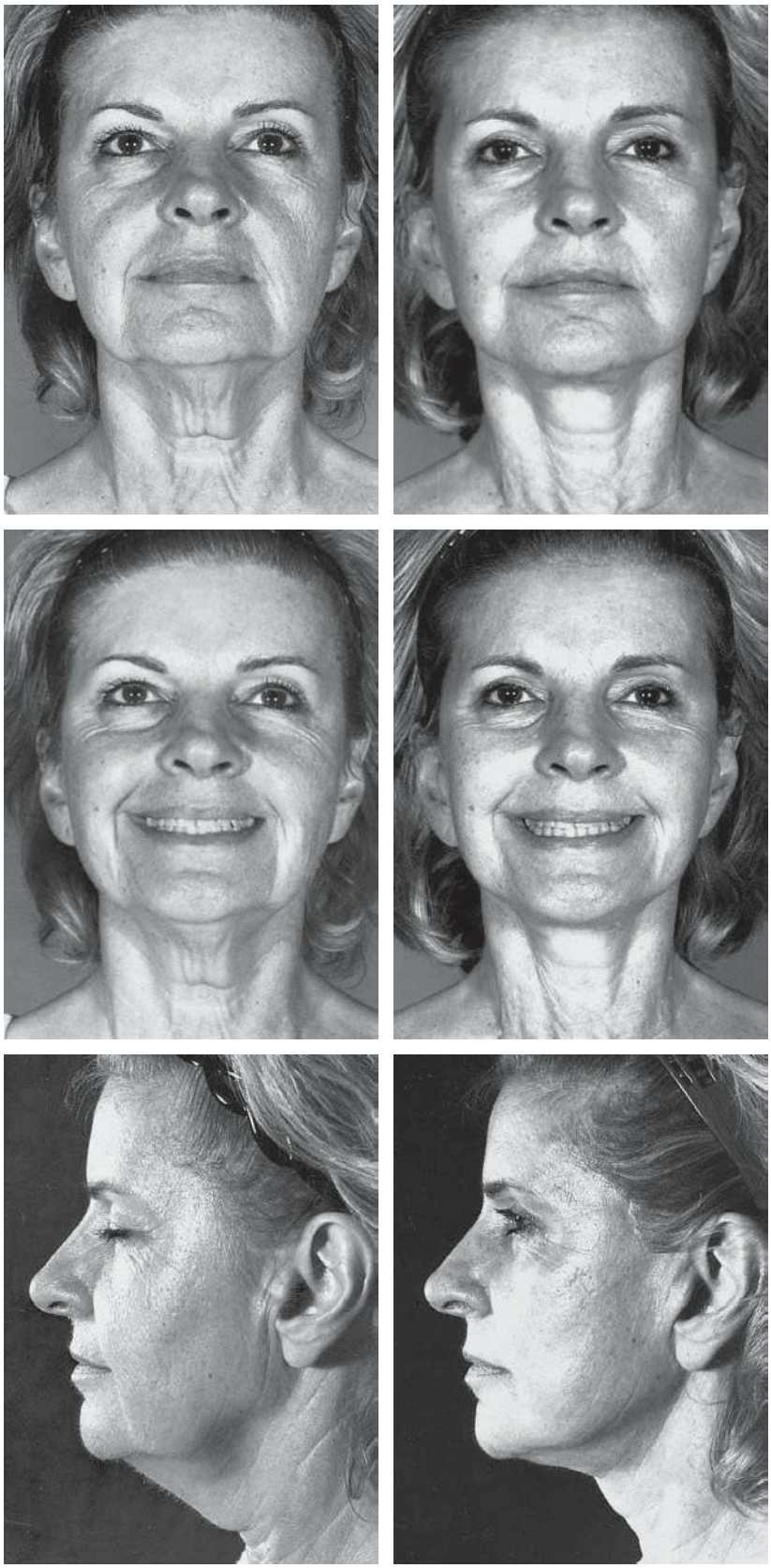
Surgical Plan

The treatment plan consisted of:

- Local anesthesia with intravenous propofol
- Open-neck liposuction and approximation of the medial platysma
- Lateral SMASectomy

Postoperative Results

Although this patient has a nice improvement after undergoing short-scar rhytidectomy, the postoperative result demonstrates persistent cervical laxity extending to the sternal notch. The patient was not happy and required neck revision with a classic retroauricular incision. This much cervical laxity can only be corrected with wide through-and-through undermining and removal of excess skin via the retroauricular occipital incision.



Short-Scar Face Lift for the Type IV Patient

Aesthetic Analysis

This 64-year-old woman is a Type IV ("poor") candidate for a short-scar lift. She demonstrated poor skin elasticity and deep horizontal cervical creases below the cricoid.

Surgical Plan

The treatment consisted of:

- Short-scar rhytidectomy
- SMAS plication
- Chin implant

Postoperative Results

The patient's 1-year postoperative results show minimal improvement of the neck, with accentuation of the cervical creases. The poor result demonstrates limitations of the short-scar technique for this type of patient, who has excessive sun damage and poor skin elasticity. The better approach would be a classic rhytidectomy with submental incision and wide undermining for maximum skin redraping.

Surgical Pearls

- The best candidates for short-scar rhytidectomy are younger, with better skin elasticity and less cervical laxity.
- Perform skin flap undermining under direct visualization to minimize trauma to the subdermal plexus and preserve the layer of subcutaneous fat on the undersurface of the flap.
- Perform lipoplasty before elevating skin flaps and avoid oversuctioning.
- If active prominent platysma bands are present, open the neck and undermine to perform medial platysma approximation.
- Plication is always preferred in patients with thin faces.
- A lateral SMASectomy performed when debulking is aesthetically beneficial.
- For maximal midface correction, extend plication or SMASectomy over the malar eminence just short of the lateral commissure.
- If a lateral SMASectomy is performed, keep the dissection superficial to the deep fascia to avoid the parotid gland and facial nerves.
- After plication or SMASectomy, the last suture lifts the malar fat pad securing it to the malar fascia.
- Finally, not every patient is a candidate for the short-scar technique; some will benefit more from classic retroauricular and occipital incisions.

BIBLIOGRAPHY

Baker DC. Complications of cervical rhytidectomy. Clin Plast Surg 10:543-562, 1983.

Baker DC. Deep dissection rhytidectomy: A plea for caution. Plast Reconstr Surg 93: 1498-1499, 1994.

Baker DC. Lateral SMASectomy. Plast Reconstr Surg 100:509-513, 1997.

Baker DC. Lateral SMASectomy. Semin Plast Surg 16:417-422, 2002.

Baker DC. Minimal incision rhytidectomy (short scar face lift) with lateral SMASectomy: Evolution and application. Aesthetic Surg J 21:14-26, 2001.

Baker DC. Minimal incision rhytidectomy (short scar face lift) with lateral SMASectomy: Operating strategies. Aesthetic Surg J 21:68-80, 2001.

Baker DC, Conley J. Avoiding facial nerve injuries in rhytidectomy: Anatomical variations and pitfalls. Plast Reconstr Surg 64:781-795, 1979.

Baker DC, Hamra ST, Owsley JQ, et al. Ten year follow-up on the twin study. Presented at the Annual Meeting of the American Society for Aesthetic Plastic Surgery, New Orleans, LA, April 2005.

Conley J. Face-Lift Operation. Springfield, IL: Charles C Thomas, 1968.

Duffy MJ, Friedland JA. The superficial-plane rhytidectomy revisited. Plast Reconstr Surg 93:1392-1403, 1994.

Mitz V, Peyronie M. The superficial musculo-aponeurotic system (SMAS) in the parotid and cheek area. Plast Reconstr Surg 58:80-88, 1976.

Passot R. La chirurgie esthetique des rides du visage. Presse Med 27:258-262, 1919.

Pitanguy I. Facial cosmetic surgery: A 30-year perspective. Plast Reconstr Surg 105: 1517-1526, 2000.

Rees TD, Aston SJ. A clinical evaluation of the results of submusculo-aponeurotic dissection and fixation in face lifts. Plast Reconstr Surg 60:851-859, 1977.

Robbins LB. Face and neck lift. Aesthetic Surg J 19:70-77, 1999.

Saylan Z, The S-lift: less is more. Aesthetic Surg J 19:406-409, 1999.

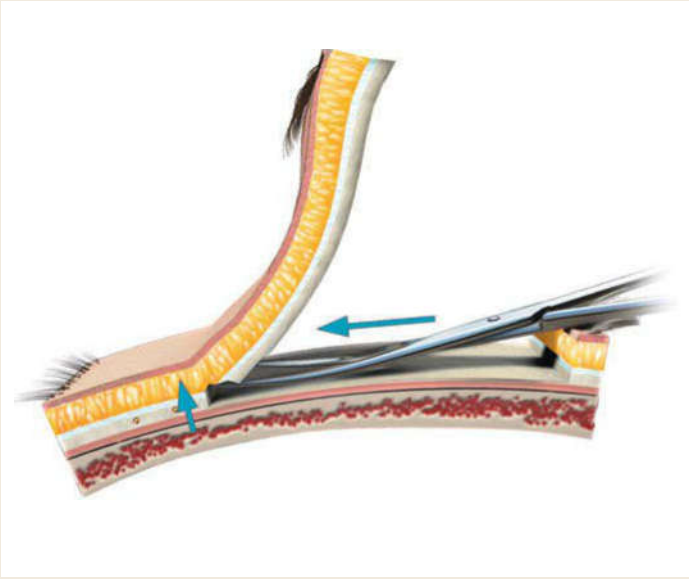
Tipton JB. Should the subcutaneous tissue be plicated in a face lift? Plast Reconstr Surg 54:1-5, 1974.

Tonnard PL, Verpaele AM. The MACS-Lift: Short-Scar Rhytidectomy. St Louis: Quality Medical Publishing, 2004.

Tonnard P, Verpaele A, Monstrey S, et al. Minimal access cranial suspension lift: A modified S-lift. Plast Reconstr Surg 109:2074-2086, 2002.

Part II

Combined Approaches and Synergistic Procedures

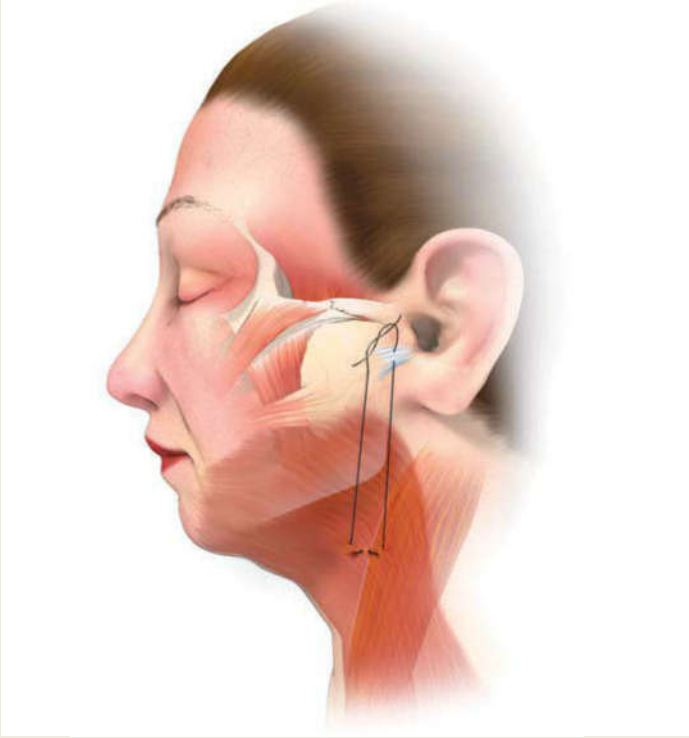


Chapter

7

The Anatomic Basis of Platysma Suspension

Daniel Labbé • Julien Nicolas



Platysma suspension provides a complementary treatment of the aging neck when there is an important cutaneous distention or marked platysma bands. We use platysma suspension together with platysmapexy and the MACS-lift suspension in cervicofacial lifting procedures. The platysma suspension can also be used alone in the case of a pure cervical lift.

Platysma suspension is based on the same concept as the MACS-lift and is founded on the same anatomic principles (deep gliding plane, plication, anchoring to a solid fixation point, and Loré's fascia).

EMBRYOLOGY AND ANATOMY

Embryology

The facial muscles and the platysma are derived from the same branchial arch (arch VII or hyoid arch) during embryogenesis. They are innervated by the facial nerve and separated from the deep cervical structures, which have a different embryologic origin.

At a gestational age of 9 to 10 weeks, the platysma consists mainly of myoblasts. Mesenchymal cells, which are considered the precursors of the platysmal fascia, surround these myoblasts. There is an additional mesenchymal layer between the sternocleidomastoid muscle and the platysma. This layer is not attached to the platysma. In a fetus of 13 to 14 weeks' gestation, the platysma is situated immediately beneath the skin. The sternocleidomastoid muscle is located under the platysma and surrounded by the superficial cervical fascia. The fascia of both the platysma and the sternocleidomastoid muscle glide on a thin layer of areolar connective tissue called the *superficial cervical fascia*.

Anatomy

The SMAS

In 1976 Mitz and Peyronie described the superficial musculoaponeurotic system (SMAS), which consists of a continuous structure of elements situated in a single plane. The superficial fascia at the undersurface of the subcutis is uniform and homogeneous over the whole body surface. The posterior border of the SMAS is attached to the auricular cartilage and the tragus, covers in a rather dense layer the parotid region containing the parotid fascia proper, and is in continuity with the muscular fibers of the orbicularis oculi muscle and the frontalis muscle cranially and with the fibers of the platysma caudally.

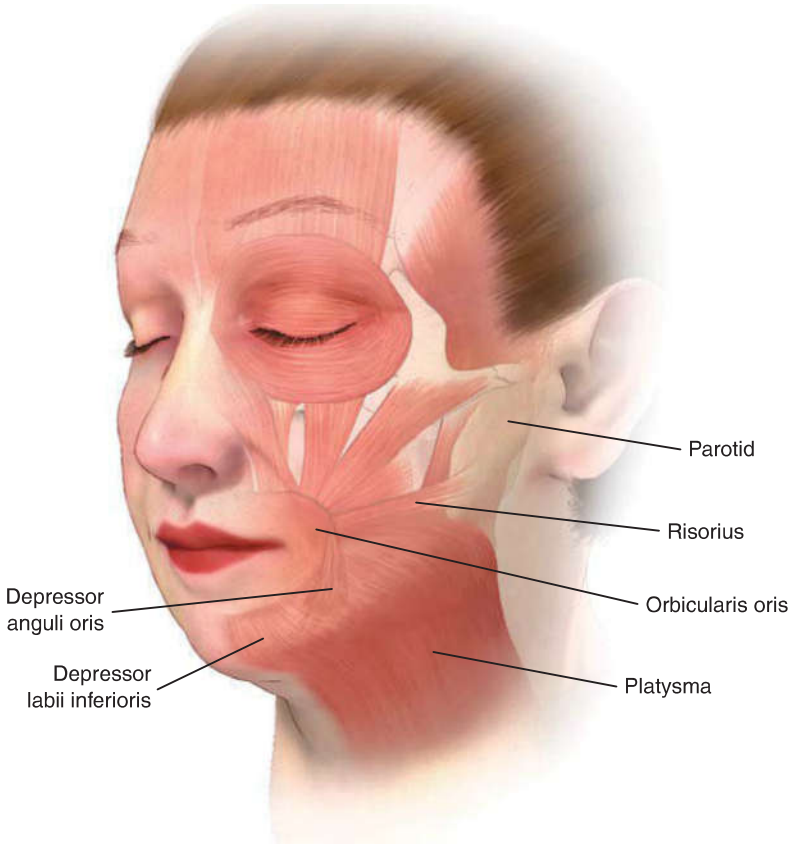
The cheeks consist of two viscoelastic layers, the skin and the SMAS, which are densely connected by fibrous septa. It seems that all these elements form one functional unit capable of executing the intricate movements of facial expression. The SMAS itself is a composite tissue consisting of collagen, elastic fibers, and adipocytes in a viscous extracellular matrix. It has the typical viscoelastic properties of reptation, stress relaxation, and hysteresis. In certain individuals, after placing tension on the SMAS during surgery, relaxation is observed a few weeks to a few months after the surgery. In contrast, this relaxation can be observed in skin just minutes after the surgical maneuver.

The Platysma

The platysma is a very wide, thin quadrangular muscle covering the anterolateral region of the neck and the inferior part of the face. It reaches from the thorax to the mandible and the cheek. Caudally, along the scapular girdle, this muscle is attached to the undersurface of the skin covering the acromion, the deltoid, and the infraclavicular region. Distally, the muscle fibers are initially distinct and separated from one another and run in a mediocranial direction, gradually uniting to form a continuous muscular layer. The platysmas are separate from one another at their origin and run obliquely upward toward each other. Very often platysmal fibers overlap in the midline near the mental region.

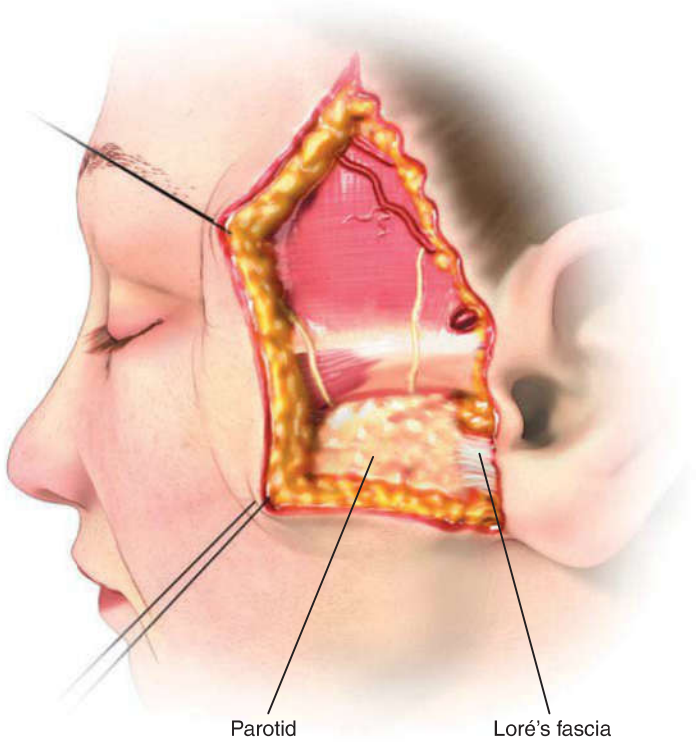
Superiorly, the platysma muscle has the following cutaneous as well as bony insertions:

- The anterior fibers insert in the skin of the mental protuberance after crisscrossing each other.
- The middle fibers insert into the inferior mandibular border and to the anterior part of the oblique line, crossing the fibers of the depressor anguli oris and depressor labii inferioris muscles.
- The posterior or lateral fibers are partly in continuity with the lateral fibers of the depressor anguli oris muscle; others run directly to the labial commissure and the cheek skin.



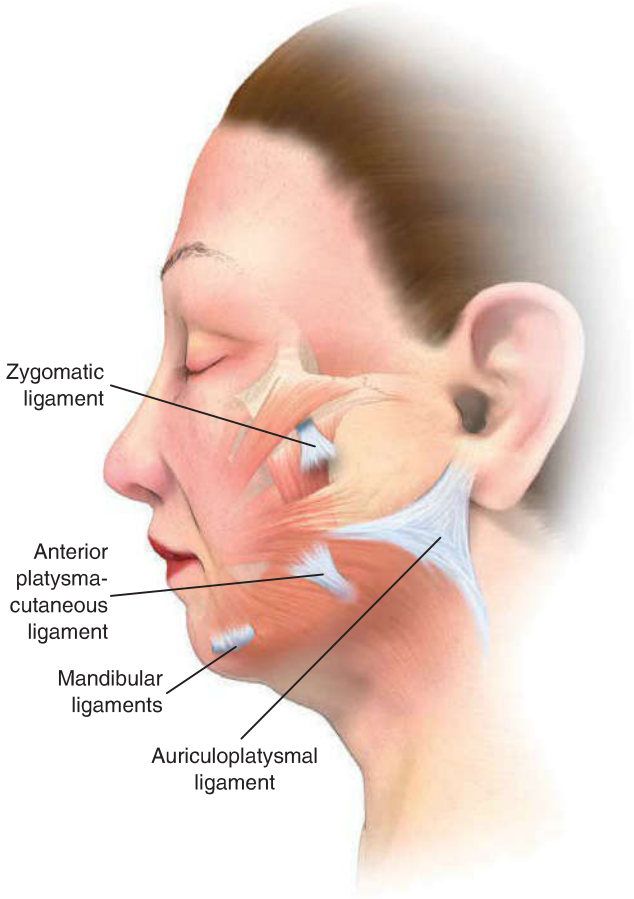
Loré's Fascia

The temporoparotid fascia, or fascia of Loré, was described in 1973 by John Loré. It is well known by surgeons familiar with the dissection of the trunk of the facial nerve, in particular in the parotid gland. This fascia is located between the tympanomastoid fissure and the parotid gland. It is one of the fixation points of the parotid gland and is located immediately anterior to the intertragal incisure. Loré's fascia is a very strong structure used as an anchor point for platysma suspension.



The Auriculoplatysmal Ligament

The auriculoplatysmal ligament was first described by David Furnas in 1989. It consists of a complex condensation of fascia. It inserts on the dermis of the inferior part of the auricular region at the level of the ear lobule where it is considered to merge with Loré's fascia. It runs obliquely downward and anteriorly, and ends at the level of the posterior border of the platysma. Cranially and posteriorly, it is in close relationship with the skin of the inferior auricular region and Loré's fascia. Cranially and anteriorly, it is in relationship with the platysma and greater auricular nerve. Deeply, it is in relationship with the parotid fascia, and superficially with the dermis.



Functional Anatomy

Gliding Planes

In their work on gliding planes between separate structures, Gimberteau et al abandoned the theory of lamellar spaces and developed the new concept of a structure composed of multiple microvacuolar units. In areas where more important longitudinal displacement is needed, the vacuoles in the structures are more delicate and greater in number. Aging deforms these structures and disturbs the basic tonus of the tissues, a phenomenon that can be observed in the gaping of a wound after a surgical incision. The areolar structure varies by region, causing differences in gliding capacities and displacement amplitudes according to the tissues. This explains that platysma suspension allows a different repositioning according to the anatomic areas in relationship to the gliding planes and deep connections.

Spasm and Contracture of the Platysma

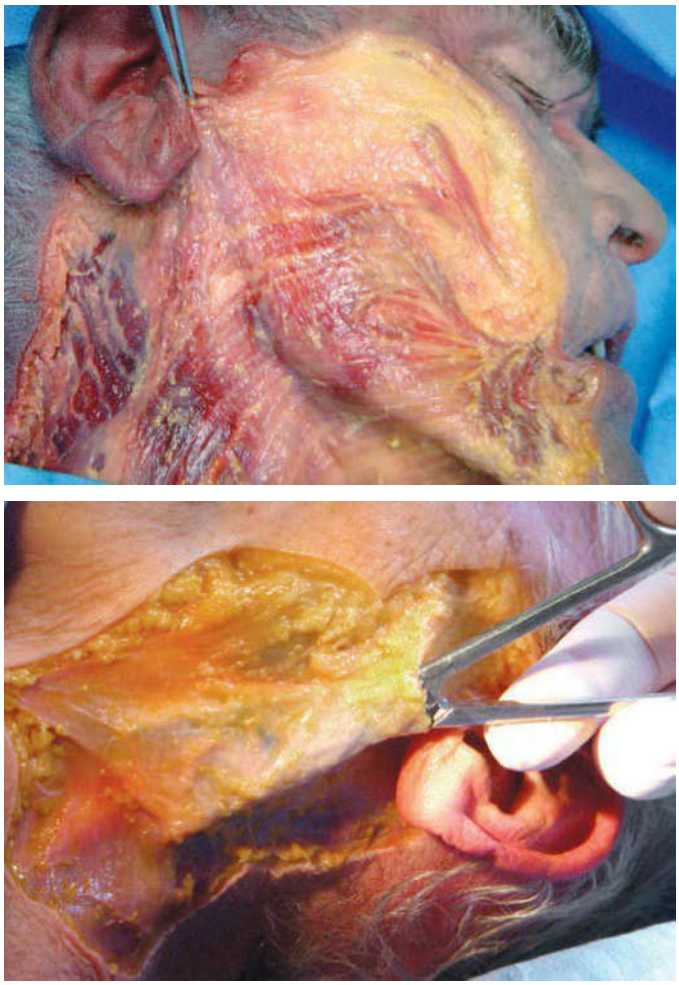
When treating the sequelae of facial palsy, both the paralyzed side and the spasm and synkinetic contractions of the healthy side must be treated. In the platysma these spasms are visible as platysmal bands, often creating the false impression of skin laxity. The treatment for these conditions is repeated botulinum toxin injections, which act at the level of the motor endplate to paralyze the platysma, as seen in this patient before and after one session of botulinum toxin to treat unilateral spasm of the platysma muscle. Aging of the neck consists of ptosis together with spasm of the platysma. This means that botulinum toxin can be used before surgical platysma suspension to paralyze the platysma during the postoperative healing period.

Surgical Anatomy

Determining the key point

Traction on the key point of the platysma

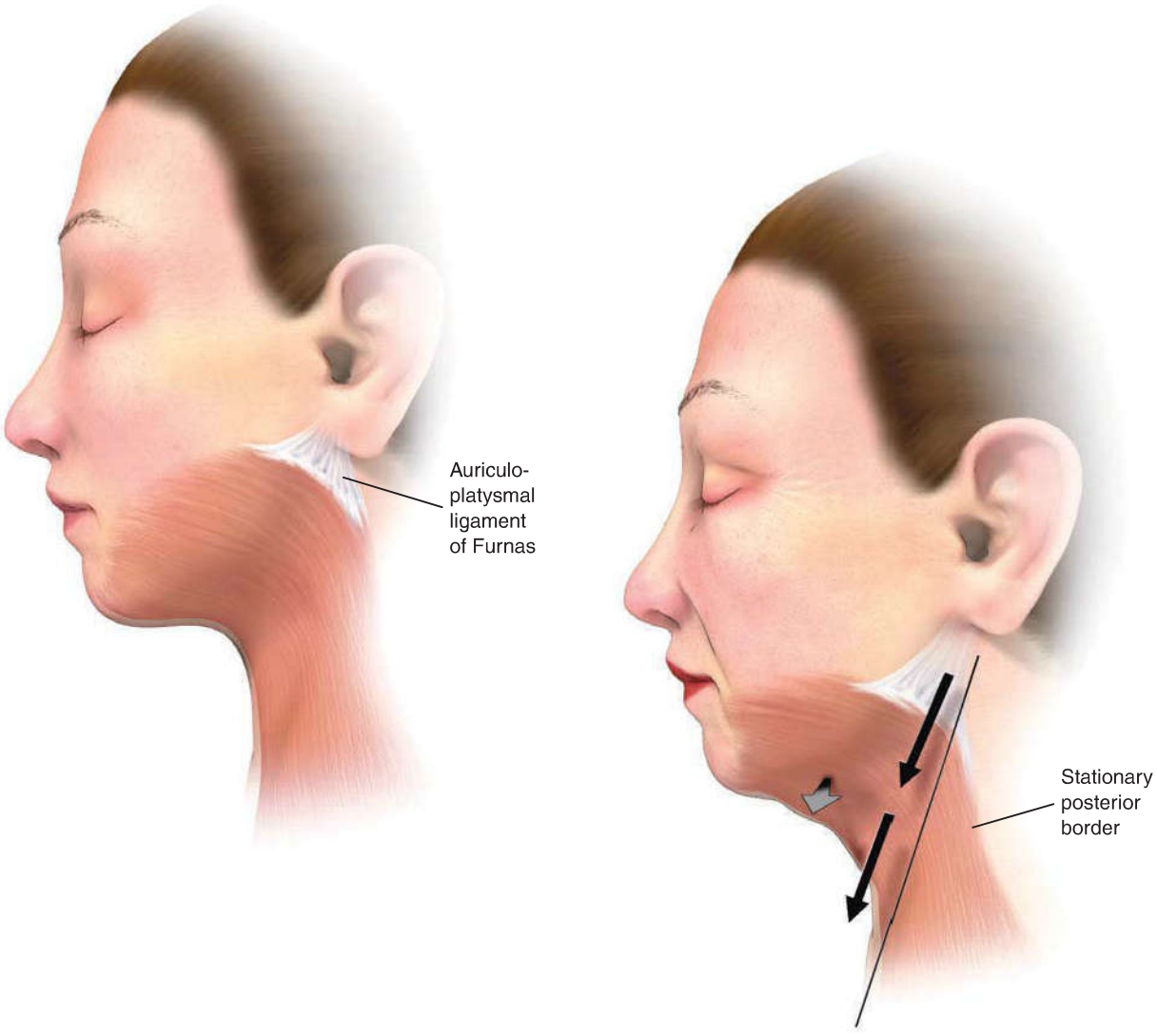
We performed an anatomic dissection on 10 fresh cadavers (20 hemifaces) to develop the technique of platysma suspension in association with platysmapexy. In Dr. Joel Feldman's discussion of our article pertaining to these dissections, he inquired about the relationship between platysma suspension and the auriculoplatysmal ligament of Furnas. This question became the impetus for a second study in which we sought to determine this relationship.



Our second study was performed on five cadavers (10 hemifaces). This study demonstrated that the auriculoplatysmal ligament of Furnas is in continuity with the superficial parotid fascia and actually constitutes the platysmal suspensory ligament. The key point for the platysma suspension is found using a solid hook and, when placed under vertical tension, auriculoplatysmal ligament (ligament of Furnas) plication is achieved. Furthermore, the auriculoplatysmal ligament has a strong fan-shaped insertion on the cranioposterior part of the platysma.

In summary, this second anatomic study has demonstrated that platysma suspension with platysmapexy in fact corresponds to plication of the auriculoplatysmal ligament of Furnas.

This anatomic work has allowed us to make observations concerning the aging of the neck. The traditional theory of aging of the neck and platysma is based on a posteroanterior gliding direction of the platysma. Our anatomic observations have demonstrated that aging of the platysma takes place along an *oblique* vector oriented downward and anteriorly resulting from distension of the auriculoplatysmal ligament of Furnas in this direction. At the same time, the posterior border of the platysma stays fixed in the anteroposterior direction. At this level the insertion of the platysma is fixed and therefore does not allow the platysma to glide anteriorly. This means that aging takes place in an oblique direction mainly downward and discretely anteriorly.



INDICATIONS AND CONTRAINDICATIONS

We consider platysma suspension to be a useful complement to the MACS-lift technique for treatment of a difficult neck. Platysma suspension replaces the platysmal suture (first loop) of the MACS-lift. As the key point is placed more caudally, the axis is still essentially vertical. This platysmapexy treats all regions of the neck. However, the submental region remains difficult to treat and sometimes necessitates an additional submental incision to perform a resection of suprahyoid platysmal bands, an excision of subplatysmal fat, or even a corset platysmaplasty.

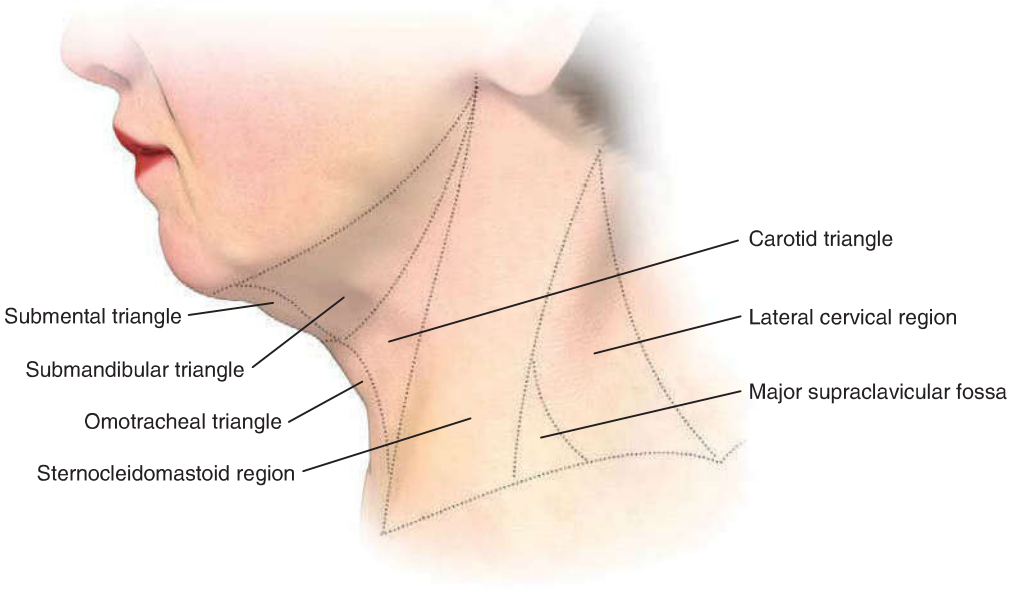
In our view, the platysmal suture of the MACS-lift should be reserved for necks with a mild laxity or younger women, whereas the platysma suspension is indicated for correction of more difficult necks. Platysma suspension allows a more efficient repositioning of the platysma-skin complex, albeit at the cost of a retroauricular incision extending to a degree into the hair-bearing skin to absorb and resect the skin excess. Because we are very satisfied with the platysma suspension, we tend to readily expand our indications.

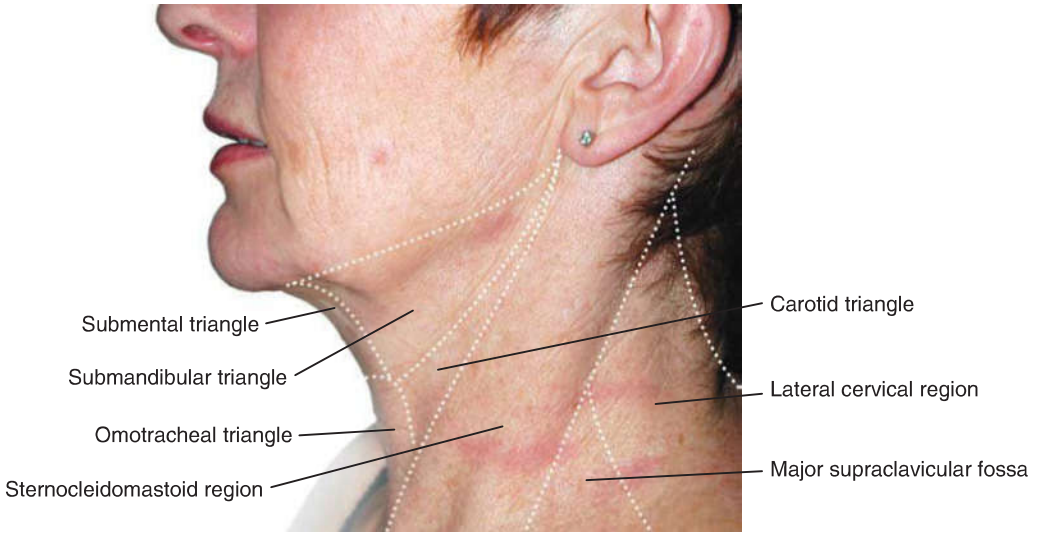
PREOPERATIVE PLANNING

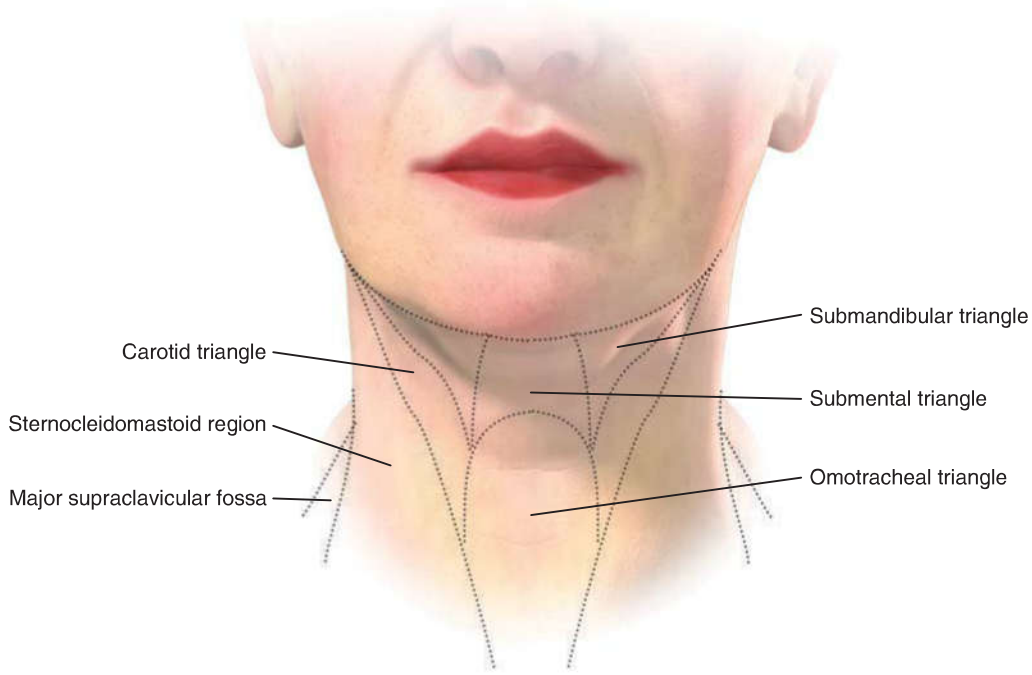
This chapter describes preoperative planning of a pure cervical lift. For the middle and superior third of the face we follow a preoperative plan similar to that for the MACS-lift technique described by Tonnard and Verpaele (see Volume I, p. 70).

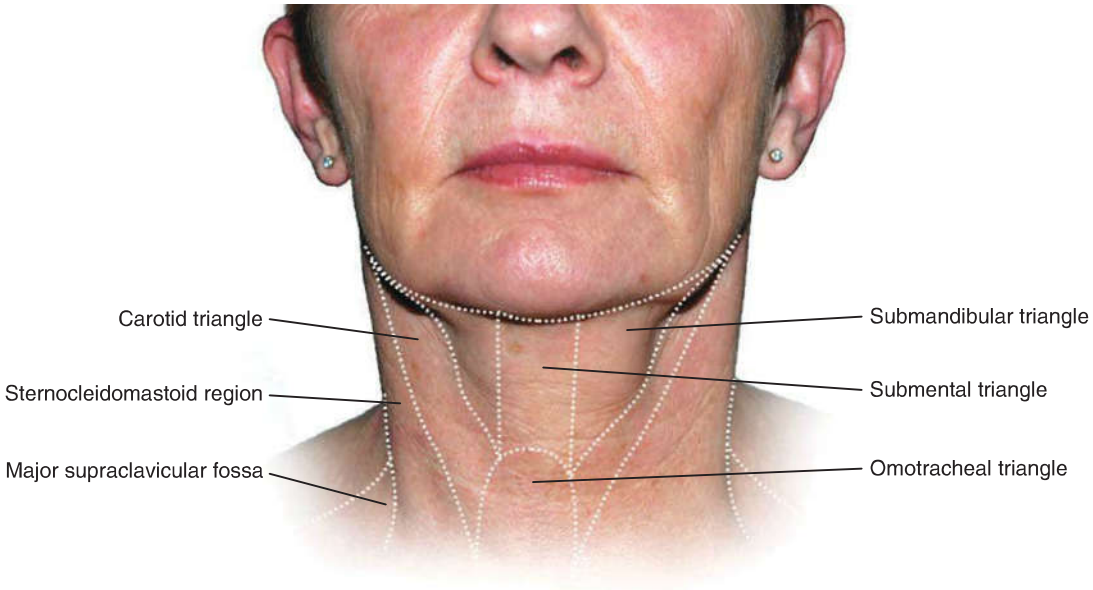
Assessment of Excess Skin

First, the amount of skin excess is evaluated at the level of the anterior cervical triangle, and the submental and median supraclavicular regions.









Assessment of Platysmal Bands

The effect of platysma suspension on the anterior cervical triangle is simulated.

Determining the key point

Marking of the suprahyoid band resection and submental skin incision

Next we look for anterior, median, and posterior platysmal bands. At this moment, it is determined whether a botulinum toxin injection would be beneficial, and if suprahyoid platysmal band resection is necessary. Hypertonicity or spasm of the platysma and the depressor anguli oris muscles is evaluated.

Assessment of Cervical Fat

We also evaluate preplatysmal and subplatysmal fat accumulation in the submental area and the global fat content of the neck.

Assessment of Scars

Finally, the position and quality of existing scars are assessed to adapt the placement of future incisions.

We always start our cervical lift with a platysma suspension with a plication of the auriculoplatysmal ligament of Furnas. Preoperative injections of botulinum toxin (Botox), resection of the suprahyoid platysmal bands, a cervical suction lipectomy, and/or an open subplatysmal fat resection may be performed, based on the findings of the preoperative assessment.

PREOPERATIVE BOTULINUM TOXIN INJECTION

Injection Methods

Botulinum toxin injections are performed 5 to 50 days before the surgical intervention. These can be performed by the surgeon or a dermatologist. The platysmal bands are injected directly, and the anterior, median, and posterior bands are revealed by asking the patient to contract their platysma, also known as the *maneuver of Babinski*. The injection is performed during the muscular contraction. The level of the injections is intramuscular or between the muscle and the skin, but never under the platysma muscle. Every platysmal band receives three to four injections of 2.5 units of Botox.

Complications of the Injections

Complications can occur when the botulinum toxin is injected underneath the platysma and when too high doses are used (for example, speech problems). With the injections performed as described here, not a single complication was encountered during 3 years in more than 90 cases.

Advantages of Botulinum Toxin Injections

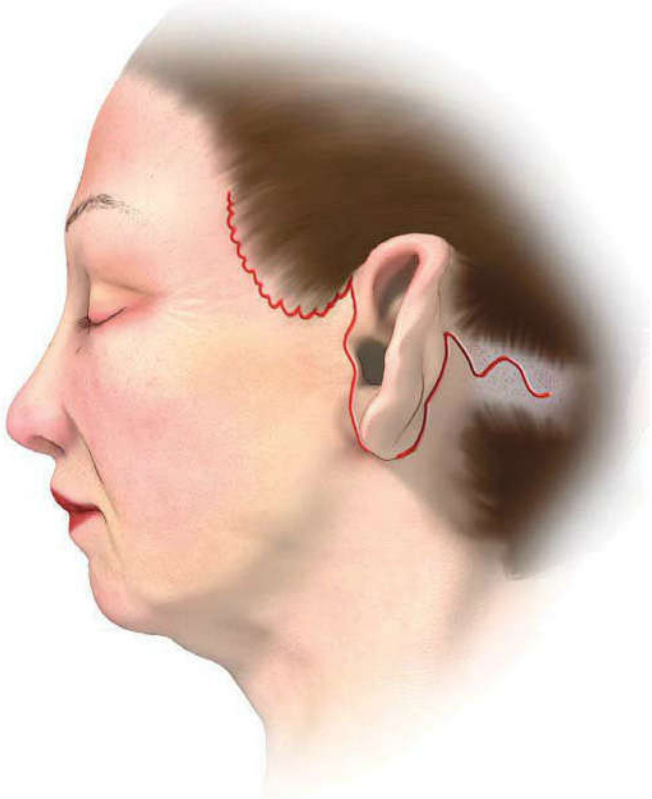
The goal of these injections is to paralyze the platysma in the preoperative period. Platysma contraction postoperatively increases the risk of tearing the muscle fibers at the suture points. Preoperative botulinum toxin administration allows healing under the best conditions. Paralyzing the muscle makes it easier to reposition the platysma, eliminating curarization when performed under general anesthesia. The main advantage, however, is the avoidance of platysmal tearing at the key point, especially in elderly patients with thin and atrophic platysmas and in patients with hypertonicity with spasm of the platysma (permanent and thick anterior platysmal bands).

OPERATIVE TECHNIQUE

Key Elements

- Preoperative testing of the key point of platysma suspension (see p. 250, *top*)
- Intraoperative determination of the key point with a sturdy hook
- Absence of (or no) subplatysmal undermining
- Reinforcement of the key point by plicating the ligament of Furnas with a running suture

The surgery is performed under local anesthesia with sedation or premedication, or general anesthesia with oral intubation. The tube must be fixated in a median position taking care not to distort the labial commissure or the lower lip. The tube has to remain free of the cervicomental region.



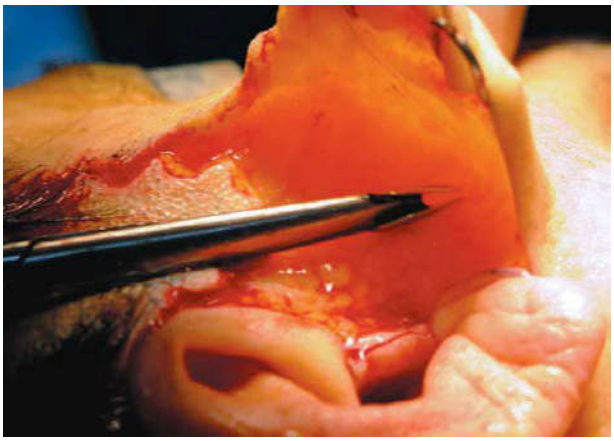
Preoperative markings; preauricular incision according to Guyuron

The temporal incision is made according to Guyuron and then descends along the tragus with a back cut in the inferior part. The incision runs around the lobule at a distance of 2 to 3 mm and then continues retroauricularly, crosses the retroauricular skin horizontally at the level of or above but never below the retroauricular muscle (which is visible when the pinna is folded forward), and then follows the hairline in an undulated fashion. These undulations prevent a hairline step-off deformity.

The anchor points at which the sutures described by Tonnard and Verpaele will be attached as well as the limits of the cutaneous undermining have been marked preoperatively with the patient in the upright position.

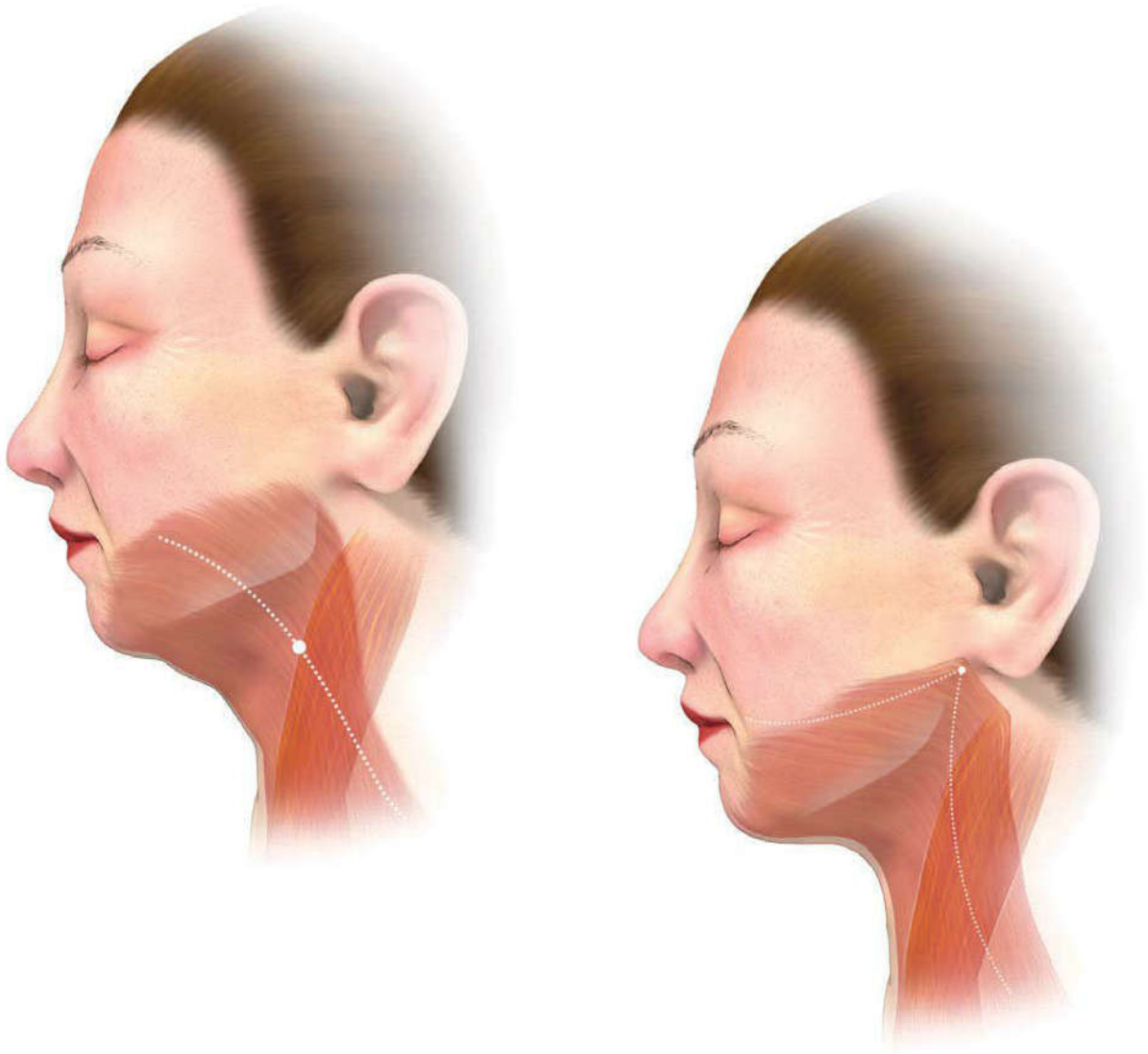
When appropriate, the upper and lower eyelid corrections and lipofilling areas (nasolabial folds, lips, and lower eyelids) are marked.

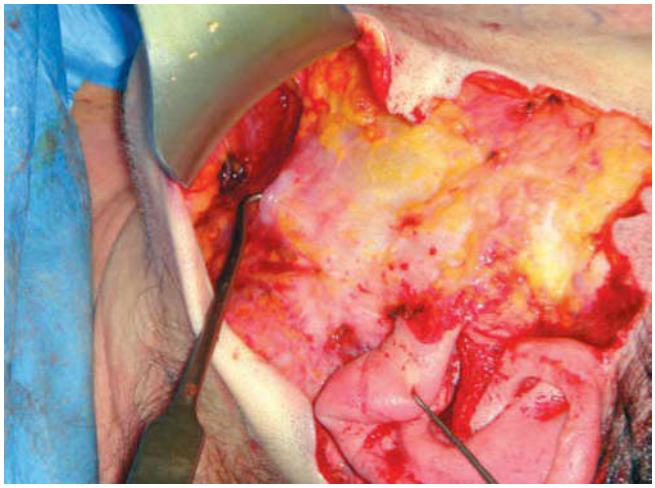
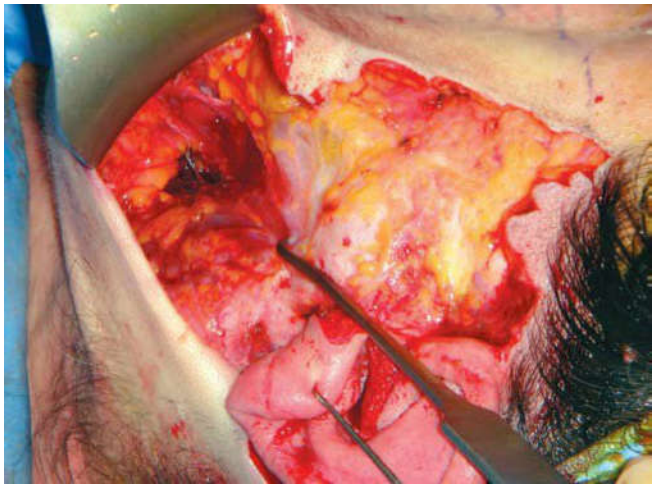
Each side of the neck and face is infiltrated with 100 ml of normal saline solution containing 1 mg of epinephrine per liter. After the epinephrine takes effect, the skin flap is created with the Trepsat scissors. The dissection is performed in a subcutaneous plane, preserving a few millimeters of fat on top of the platysma and SMAS. It is essential to visualize the platysma so that its posterior border can be grasped. The first generation of face lifts was also performed in the subcutaneous plane.



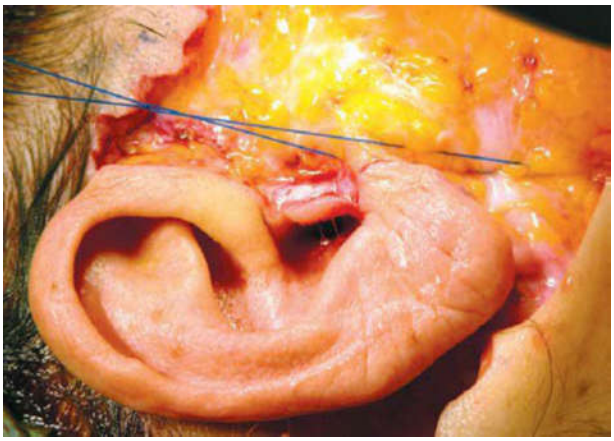
Our dissection, however, is more limited in the anterior direction of the neck, but more extended caudally in the region of the sternocleidomastoid muscle to achieve repositioning of the platysma-skin complex with a vertical vector. It is essential to perform the dissection in this tissue plane to obtain a locking effect on the result by adherence of the different tissue planes.

The key point of the suspension is determined. It is located about 3 cm below the mandibular border, in the triangle formed by the border of the mandible and the anterior part of the sternocleidomastoid muscle. It is preferable to select a key point as low as possible to obtain a vertical vector of traction, which will produce better definition of the cervicomental angle. If the key point is too anterior, the vector will be too horizontal and the cervicomental angle will be less well defined.

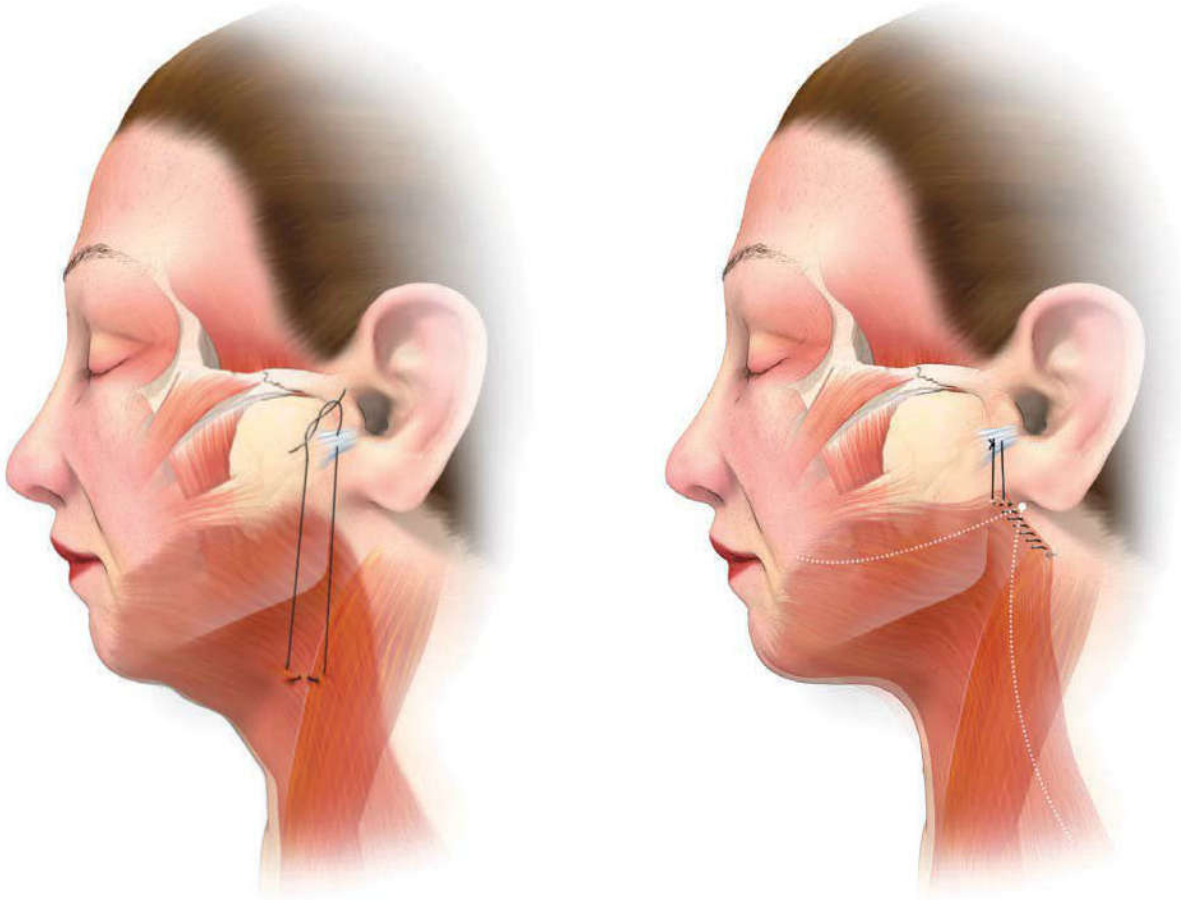


The key suture is inserted between the platysma at the key point and the fascia of Loré or temporoparotid fascia with a 2-0 nonresorbable monofilament nylon suture. The key point is determined using a strong hook by pulling up at this point usually slightly inferior to the insertion of the ligament of Furnas.



At this point the anterior triangle of the neck is well redefined and the demarcation of the mandibular border and the anterior edge of the sternocleidomastoid muscle is clear. The traction is aimed at repositioning the platysma about 3 to 4 cm in a cranial direction to redefine the anterior border of the sternocleidomastoid muscle and the mandibular border, and to lift and support the submandibular gland by direct action on the fascia superficialis. This key suture is a purse-string suture of the platysma and a simple bite in Loré's fascia. This platysmal suspension and platysmapexy at the level of Loré's fascia causes a plication of the auriculoplatysmal ligament of Furnas. The purse-string design of the suture allows fine tuning of the platysma suspension and achieves a strong platysmapexy to Loré's fascia.



A posterior reinforcement and redraping suture is placed between the posterior platysmal border and the aponeurosis of the sternocleidomastoid muscle. This suture does not add any vertical lift. According to Tonnard and Verpaele, SMAS plication is achieved, completed with a running suture between the SMAS and the parotid fascia as described by Fogli, which corresponds to the suture achieving plication of the auriculoplatysmal ligament of Furnas.

For the neck lift, the continuous suture runs between the posterior reinforcement and redraping suture described above and the parotid fascia. This suture reinforces the key point of the platysma suspension, achieving redraping and plication of the ligament of Furnas.

When performed with a MACS-lift, the running suture described by Fogli is continued to the zygoma.

The key point is reinforced with a running suture between the parotid fascia and the fascia of the sternocleidomastoid muscle.

Next the skin is excised and redraped in a nearly vertical direction. Using the Pitanguy forceps, 2-0 sutures are placed just behind the ear. The skin resection should be straight because the zigzag incision on the nondissected side will absorb the skin excess. The skin is redraped without excessive tension. Suction drains are placed in each side, and the closure is performed in two planes. Usually each side is treated and sutured separately. It is, however, also possible to perform the dissection sequentially on both sides and place the sutures simultaneously to better regulate the platysma suspension.


A compressive bandage and Steri-Strip skin closures are placed. Obviously, this technique can be performed with ancillary procedures such as a submental suction lipectomy and/or resection of suprahyoid platysmal bands.

POSTOPERATIVE CARE

The compressive bandage is worn for 12 hours and the Steri-Strip dressing for 7 days. The suction drains are removed 12 hours postoperatively. The sutures are removed between postoperative days 10 and 15.


Preauricular and postauricular scars are shown 1 year postoperatively.

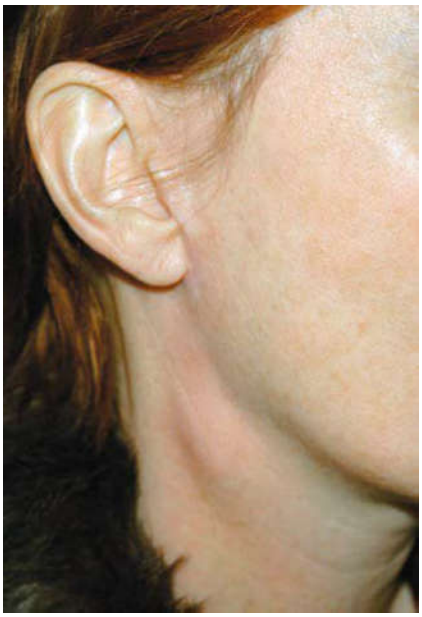
COMPLICATIONS

In 4 years, more than 100 people underwent the cervical facial lift described previously. No postoperative hematoma requiring a surgical revision has been observed. Two patients developed neuropraxia. One case of neuropraxia involved the marginal branch of the facial nerve, unilaterally affecting the lower lip. This was probably caused by a purse-string suture that was placed too high. Both cases resolved completely after 15 days without sequelae.

Neuropraxia 48 hours postoperatively

The neuropraxia fully resolved in less than 15 days.

One patient had an inflammatory reaction 6 months postoperatively to a nonresorbable suture used for platysma suspension, which was removed under local anesthesia. Removal of the suture had no deleterious effect on the result of the cervicofacial lifting.



CASE EXAMPLES
Determining the Criteria for a Youthful Neck

The criteria for a youthful neck have been described by Ellenbogen. We have attributed a score to each criterion as follows to obtain a total of 10 points:

1. The redefinition of the inferior mandibular border (4 points)
2. A suprahyoid concavity (1 point)
3. A visible thyroid cartilage (1 point)
4. The redefinition of the anterior border of the sternocleidomastoid muscle (2 points)
5. A cervicomental angle between 105 and 120 degrees (2 points)

The results are considered to be *very good* if the total score is equal to or higher than 8, *good* if it is equal to 7, and *poor* if it is less than 7.

Aesthetic Analysis

This 63-year-old woman presented for cervicofacial rejuvenation. She had no surgical history. The definition of her inferior mandibular border was absent and the anterior border of her sternocleidomastoid muscle was not visible. Her submental, submandibular, carotid, and omotracheal triangles could no longer be seen. She had anterior platysmal bands and her thyroid cartilage was not visible.

The surgery was performed under general anesthesia with one day's hospital stay because of the blepharoplasty and lipofilling.

Nonsurgical Plan

The treatment consisted of:

- Preoperative botulinum toxin injections in the platysma

Surgical Plan

The treatment consisted of:

- A MACS-lift for the middle third of the face
- Cervical lifting by platysma suspension
- Coleman lipofilling of the nasolabial folds and lips
- Upper and lower blepharoplasty

Postoperative Results

The patient's 1-year postoperative result is determined to be *good* with a score of 8. Note the good definition of the submandibular, carotid, and submental regions, and of the sternocleidomastiod muscle and the omoclavicular region.

Aesthetic Analysis

This 68-year-old woman presented for facial rejuvenation. She had undergone a cervicofacial lift 10 years before, and a lip augmentation with a resorbable filler had been performed elsewhere. The clinical history was otherwise unremarkable. The definition of her inferior mandibular border was absent and the definition of her submental, submandibular, and omotracheal triangles was poor. Her subhyoid depression was not visible. The markings were made preoperatively on black-and-white photographs to explain the treatment to the patient and to enhance her understanding of the surgical plan and the scars to be expected.

The surgery was performed under general anesthesia with one day's hospital stay.

Nonsurgical Plan

The treatment consisted of:

- Preoperative botulinum toxin injections in the platysma

Surgical Plan

The treatment consisted of:

- A MACS-lift for the middle third of the face
- A cervical lift via platysma suspension

Postoperative Results

The 1-year postoperative result is determined to be *good* with a score of 8. Note the good definition of the neck, the oval shape of the face, and the definition of the different cervical regions (submental, submandibular, carotid, omoclavicular, and sternocleidomastoid).

Aesthetic Analysis

This 61-year-old woman presented for facial rejuvenation. She had no previous surgeries and her clinical history was unremarkable. The definition of her inferior mandibular border; submental, submandibular, and omotracheal triangles; sternocleidomastoid area and anterior border; and sternomandibular trough was absent. The markings were made preoperatively on black-and-white photographs to explain the treatment to the patient and to enhance her understanding of the surgical plan and the scars to be expected.

The surgery was performed under general anesthesia with one day's hospital stay.

Nonsurgical Plan

The treatment consisted of:

- Preoperative botulinum toxin injections in the platysma

Surgical Plan

The treatment consisted of:

- A MACS-lift for the middle third of the face
- Cervical lifting by platysma suspension
- Resection of the suprahyoid platysmal bands
- Resection of the earlobes
- Coleman lipofilling of the nasolabial folds and lips
- Upper and lower blepharoplasty

Postoperative Results

The 1-year postoperative result is determined to be *good* with a score of 8. We obtained a good result in the oval shape of the face and the inferior portion of the neck, but there is persistence or reappearance of a minor suprahyoid platysmal band in the right submental region, probably caused by an insufficient resection of the right platysmal band.

CONCLUSION

Presently, the platysma suspension with platysmapexy is our basic technique for neck lifting. After having published our series and after the discussion by Feldman, we conducted new anatomic studies that allowed us to demonstrate that the platysma suspension fixed to Loré's fascia in fact corresponds with plication of the auriculoplatysmal ligament described by Furnas.

Surgical Pearls

- The anatomic principles underlying platysma suspension have been elucidated in basic research involving anatomic dissections. These have demonstrated that the gliding planes are different for each region of the face and neck and affect repositioning of the platysma-skin complex, and that undermining the platysma induces an inferior redefinition of the mandibular border and sternocleidomastoid muscle with no repositioning of the submandibular gland.
- The key point of platysma suspension is (1) checked preoperatively and confirmed intraoperatively with a hook, (2) more inferior than anterior, (3) fixed to Loré's fascia, which is not dissected, and (4) reinforced with a nonresorbable running suture placed between the fascia of the sternocleidomastoid muscle and the parotid fascia.
- Platysma suspension with platysmapexy corresponds to plication of the auriculoplatysmal ligament of Furnas.
- Platysma suspension alone allows redraping of all regions of the neck in the majority of cases; however, it doesn't obviate the need for ancillary procedures in the submental region of certain very damaged necks (for example, liposuction, subplatysmal fat resection, and resection of suprahyoid platysmal bands).

ACKNOWLEDGMENT

We would like to thank Professor Ephrem Salamé and Mr. Elissalde of the Laboratoire d'Anatomie, Centre Hospitalier Universitaire de Caen, France.

BIBLIOGRAPHY

Ascher B, Rossi B. Botulinum toxin and wrinkles: Few side effects and effective combining procedures with other treatments. Ann Chir Plast Esthet 49:537-552, 2004.

Ellenbogen R, Karlin JV. Visual criteria for success in restoring the youthful neck. Plast Reconstr Surg 66:826-837, 1980.

Feldman JJ. Neck Lift. St Louis: Quality Medical Publishing, 2006.

Feldman JJ. Platysma suspension and platysmaplasty during neck lift: Anatomical study and analysis of 30 cases. Plast Reconstr Surg 117:2008-2010, 2006.

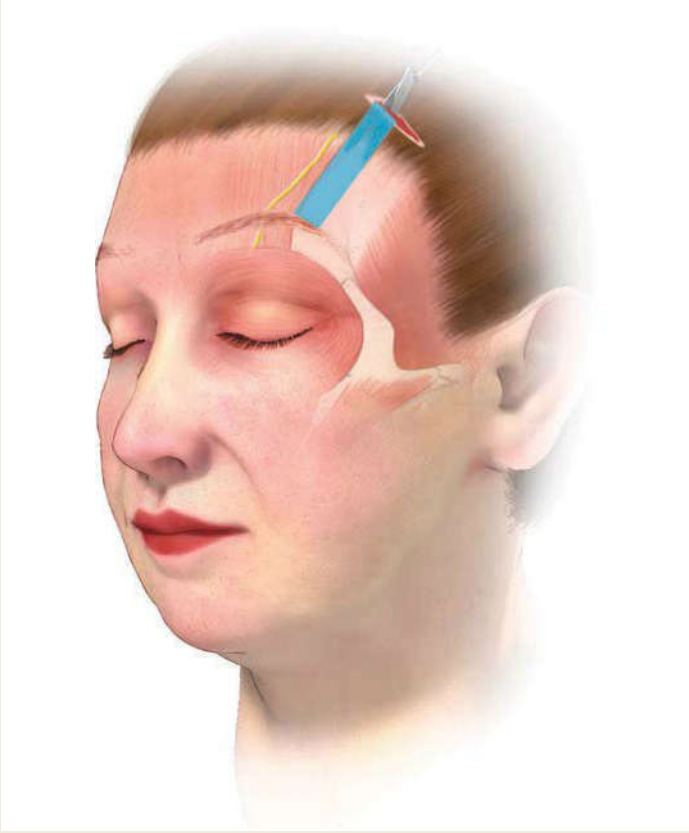
Fogli A, Jones BM, Hinderer U, et al. [Face lifts complications] Ann Chir Plast Esthet 49: 562-563, 2004.
Furnas DW. The retaining ligaments of the cheek. Plast Reconstr Surg 83:11-16, 1989.
Gardetto A, Dabernig J, Rainer C, et al. Does a superficial musculoaponeurotic system exist in the face and neck? Anatomical study by the tissue plastination technique. Plast Reconstr Surg 111:664-672, 2003.
Guimberteau JC, Sentucq-Rigall J, Panconi B, et al. [Introduction to the knowledge of subcutaneous sliding system in humans] Ann Chir Plast Esthet 50:19-34, 2005.
Guyuron B, Watkins F, Totonchi A. Modified temporal incision for facial rhytidectomy: An 18-year experience. Plast Reconstr Surg 115:609-616; discussion 617-619, 2005.
Har-Shai Y, Bodner SR, Egozy-Golan D, et al. Viscoelastic properties of the superficial musculoaponeurotic system (SMAS): A microscopic and mechanical study. Aesthet Plast Surg 21:219-224, 1997.
Kane MAC. The functional anatomy of the lower face as it applies to rejuvenation via chemodenervation. Facial Plast Surg 21:55-64, 2005.
Kane MAC. Non-surgical treatment of platysmal bands with injection of botulinum toxin A. Plast Reconstr Surg 103:656-663, 1999.
Labbé D, Franco RG, Nicolas J. Platysma suspension and platysmapexie during neck lift: Anatomical study and analysis of 30 cases. Plast Reconstr Surg 117:2001-2007; discussion 2008-2010, 2006.
Mitz V, Peyronie M. The superficial musculo-aponeurotic system (SMAS) in the parotid and cheek area. Plast Reconstr Surg 58:80-88, 1976.
Rouvière H, Delmas A. Anatomic humaine. Tome 1. Tête et cou. Masson, 2002.
Tonnard P, Verpaele A, Monstrey S, et al. Minimal access cranial suspension lift: A modified S-lift. Plast Reconstr Surg 109:2074-2086, 2002.
Trepsat F. Face lifts of the malar, jugal and nasolabial area. Ann Chir Plast Esthet 39:597-622, 1994.

Chapter

8

Temporal Lift by Fasciapexy

Alain Fogli



When performing a full face lift, one often notices an insufficient improvement at the level of the temporal and malar regions. This represents a transitory zone between the forehead and the face. The temporal lift with fasciaplasty ameliorates these problems by using an intracapillary temporal approach to elevate the tail of the brow and improve the crow's-feet and malar area. The temporal lift is accomplished by suturing the previously freed temporoparietal fascia to the temporal fascia. An associated skin resection of the lower lid is also used.

PRINCIPLES

The concept of fasciapexy is fundamentally different from that of subperiosteal techniques that lift all of the tissues en bloc. The logic of this technique is based on the fact that the ptosis of the brow tail is cutaneous. Thus this procedure is guided by three principles:

1. Skin redraping
2. Solid anchoring
3. Preservation of the hairline

I do not think that subperiosteal dissection is indicated for cutaneous improvement. Other techniques have precarious anchoring methods or move the hairline too far back. This technique prevents the illogical lift of the facial skin toward the temporal region. The improved draping guarantees more natural results and offers an excellent method to avoid round eyes. This technique can complement a forehead lift and face lift. It is usually performed with an upper and lower blepharoplasty. A canthopexy or canthoplasty is not required, except for a specific indication.

GOALS

Improvement of the clinical signs of temporal aging is the primary objective of this technique.

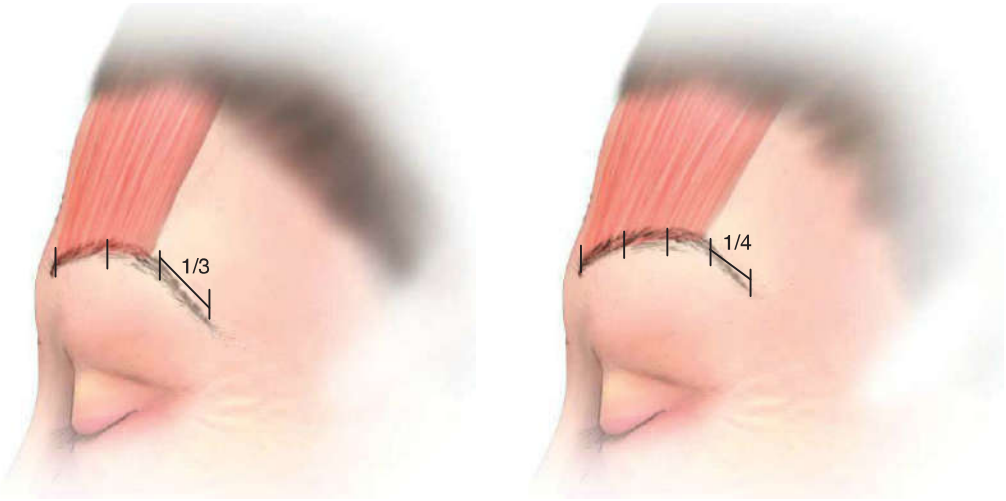
Specific goals include the following:

1. Elevation of the tail of the brow
2. Correction of crow's-feet
3. Redraping of malar skin to address temporal and malar wrinkling
4. Greater skin resection of the lower lid to correct wrinkling

ANATOMIC CONSIDERATIONS

The temporoparietal fascia represents the lateral extension of the galea and is sometimes described as the galea. Anatomically speaking, the galea ends at the level of the temporal crest and what we call *galea* is actually the temporoparietal fascia. That explains the title of the first article I published on the subject: "Temporal Lift by Galeapexy."

The galea is adjacent to the superficial temporal fascia and the periosteum of the frontal bone. These three structures are confluent in a 5 to 6 mm band located in the medial part of the temporal bone crest and are adherent to the periosteum and the bone.

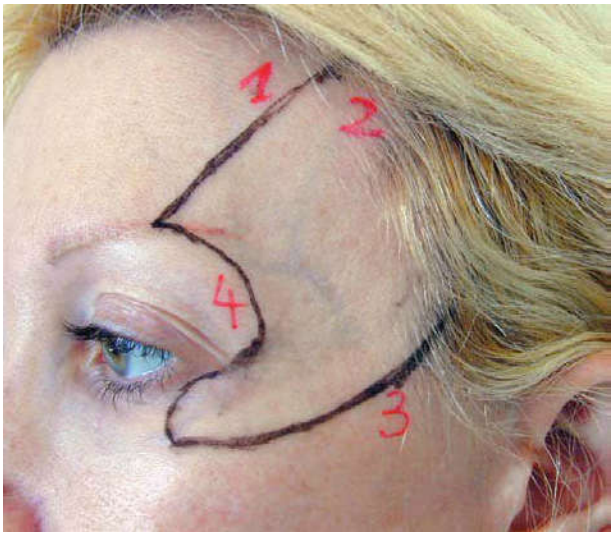


Depending on the obliquity of the temporal crest, the tail of the brow will measure from one third *(left)* to one quarter *(right)* of the total length of the brow. The brow tail is not under the influence of the frontal muscle, which is an elevator. Its ptosis is only influenced by the depressors, such as the orbicularis oculi muscle.

The temporal branch of the facial nerve is located between 1 and 1.5 cm in the horizontal projection of the brow and there is a deep branch of the supraorbital nerve innervating the frontotemporal scalp as described by Knize. This branch is located between the deep leaflet of the galea and the periosteum and runs between the orbital rim and the inferior part of the temporal crest.

Subperiosteal detachment extends to the orbital rim *(blue line)* without danger to the temporal branch of the facial nerve and the sensitive branch running from the supraorbital nerve.

Limits of the Surgical Area



The surgical area on which this technique focuses does not correspond to the area described by anatomists. It is limited by the following landmarks:

1. The temporal crest above
2. The scalp incision posteriorly and parallel to the hairline
3. The zygomatic arch and the malar bone below
4. The orbital rim anteriorly

Planes of Dissection

The subfascial plane. Dissection of this plane allows the freeing of the different musculoaponeurotic attachments from the temporal crest without any risk of nerve damage. This will enhance the lift of the tail of the brow. This easy dissection will not risk any damage to hair follicles and can be carried out up to 1 cm in front of the hairline. The incision of the temporoparietal fascia is made under direct vision to allow us to grab and raise the flap and also to change planes easily if further subcutaneous dissection is necessary.

The subcutaneous dissection plane. A soft, meticulous dissection in this plane prevents damage to the temporal branches of the facial nerve and allows us to separate the orbital fibers of the orbicularis muscle from the skin.

ADVANTAGES

This temporal lift with fasciapexy can be used alone or in combination with an extensive lift and will accomplish the following:

- Management of cutaneous ptosis (the lowering of the brow tail, temporal, malar, and inferior lid wrinkling)
- Solid anchoring that relies on the temporoparietal fascia
- Prevention of hair loss
- Prevention of backward displacement of the hairline

This technique is efficient, reproducible, relatively easy to perform, and has a low incidence of complications if meticulously executed.

INDICATIONS AND CONTRAINDICATIONS

This temporal lift technique is indicated for a patient who presents with lateral brow ptosis with a short distance between the eyelashes and eyebrows. It is also appropriate for a patient with a lateral extended dermatochalasis with crow's-feet, which can be removed without the danger of a round eye, or with a combination of these problems.

Because the temporal region has its own unique requirements, this technique is particularly applicable for addressing problems in this area. It can be used alone in a younger patient with or without periorbital aging who has no significant nasolabial folds or jowling.

This technique is contraindicated when the entire brow is ptotic or when it is located too low. In such cases, a forehead lift by a coronal or endoscopic approach can be done. The temporal lift is not a treatment for lagophthalmos or ectropion.

OPERATIVE TECHNIQUE

Key Elements

- Specific treatment of the temporal area, which is a transitory zone between face and forehead
- Separate incision
- No surgical migration of the facial skin into the temporal area
- Avoids a lateral extension of the scar during an upper or lower blepharoplasty

Markings

While palpating the temporal area, I mark the temporal crest *(dotted line)*. Within the hairline, a 3 to 4 cm straight-line scalp incision *(continuous line)* is marked perpendicular to the temporal crest and parallel to the hairline. This line is located 3 to 4 cm behind the hairline, depending on hair density.

A second 3 to 4 cm parallel line is drawn 1 cm in front of the hairline. This is the level of the temporoparietal fascial incision that determines the extent of the subgaleal dissection. The subcutaneous dissection could extend as far as the orbital rim, the zygomatic arch, the malar bone, and the inferior palpebral area. The areas of undermining are delineated as follows:

1. Subperiosteal undermining
2. Subgaleal undermining
3. Subcutaneous undermining

Incisions

The intracapillary incision is made with a No. 15 blade. Subperiosteal detachment, following a 1 cm periosteal incision, is carried out at the level of the temporal crest as far as the orbital rim.

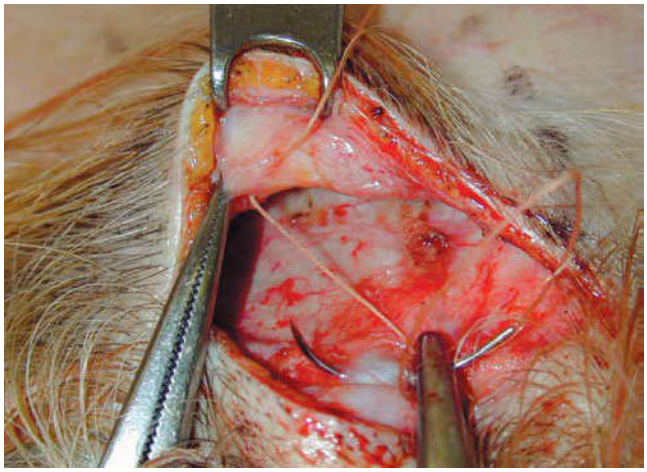
Dissection

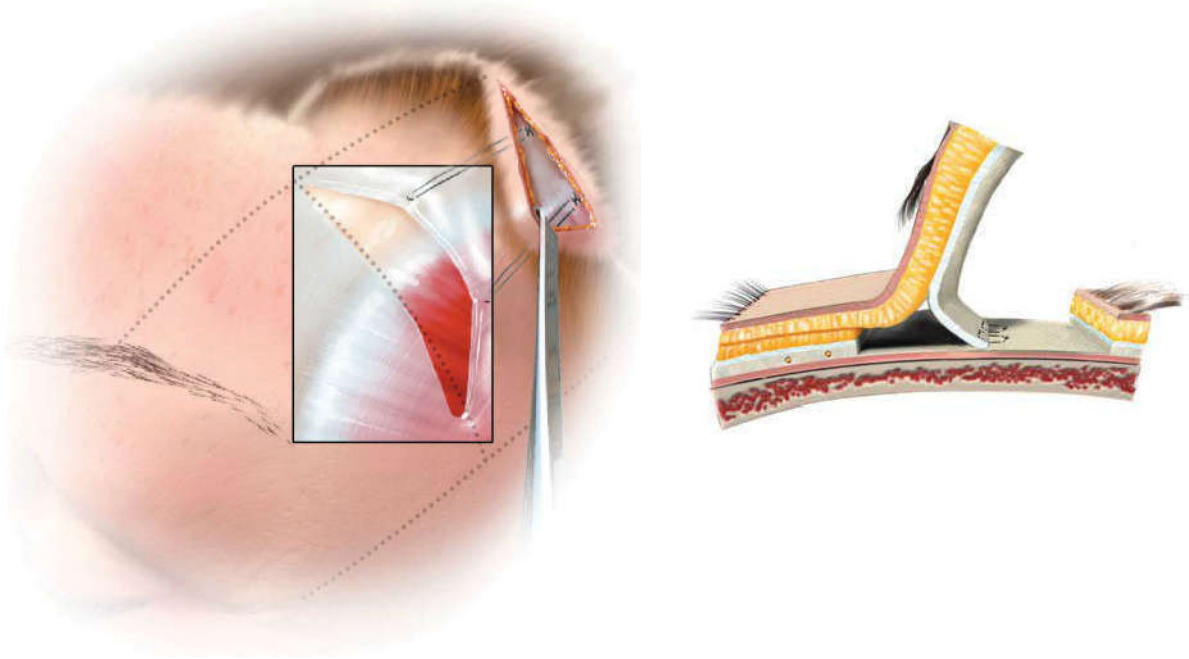
The subfascial dissection is easily carried out to the second line described earlier. With the same blunt-tipped curved scissors underneath the skin, the temporoparietal fascia is opened 4 cm at the level of the second line.

The temporoparietal fascia incision is made in front of the hairline and parallel to it. Hemostasis is established under direct vision with the electric scalpel and use of a cold light retractor.

With traction on the freed temporoparietal fascia, the mobilization of the brow tail is evaluated. Then, with traction on the temporal teguments, the mobilization of the skin of the malar area and the lower lid is also evaluated.

This maneuver is repeated at three different levels on the galea where the stitches will eventually be located, depending on what is needed. The subcutaneous dissection can be extended as hemostasis is established. The surgeon must be aware of the facial nerve located at this plane.





Once the cephalic temporoparietal fascia is in the desired position, it is fixed with a braided U-type stitch to the temporal aponeurosis. The direction of the suture is parallel to the scalp incision to avoid tearing. The distance between the cephalic and caudal edges of the galea represents the elevation as demonstrated above. Next, two more stitches are made.

Before suturing, one can dissect as much as required in the superior subfascial space to avoid unsightly pleating that would require 2 to 3 postoperative months to disappear.

At the end, the excess skin from the lower lid can be directly excised using the scissors without any resection of the fibers of the orbicularis oculi muscle.

Suture Placement

Suturing the scalp is done without tension and without resection. We use a resorbable 3-0 Monocryl. For the lower lid, we use a number 1-0 intradermis Flexocrin that is removed 3 days later, along with sutures of the potential upper blepharoplasty. No drains are used.

POSTOPERATIVE CARE

To reduce edema and bruising, I always apply ice on the temporal area for a few hours. The ice is kept in place with a dressing that is removed that evening. There will be more edema and bruising in the lower lid and at times in the malar area when there has been extensive subcutaneous dissection (needed in approximately 15% of cases).

RESULTS

To assess the results of this temporal lift, we reviewed the charts of 572 patients who were operated on between June 1996 and January 2005. The average age was 50 years old. Four hundred twenty patients benefited from a full face lift (frontal, facial, and cervical), and 20 patients had an isolated temporal lift. An associated upper blepharoplasty was done in 452 cases, and in 188 cases lower eyelid herniated fat pads were removed via a transconjunctival approach. Finally, a lower eyelid skin resection was done following a fasciapexy in 521 cases.

The results of this technique, with a 10-year follow-up for the first cases and 1-year follow-up for the last patients, are evaluated according to three criteria:

1. The distance between the eyelashes and the tail of the brow
2. Improvement of crow's-feet rated on a scale from to 1 to 3
3. Improvement of wrinkles of the lower lid and the malar lid rated on a scale of 1 to 3

Of 572 patients, 525 had a good to very good result, 25 had an average result and 22 had an unsatisfactory result. Unsatisfactory results were primarily caused by improper correction of the tail of the brow. Now we have improved our results with a subperiosteal detachment of the temporal crest and the lateral part of the orbital rim.

In my hands, this technique appears to be more efficient than the fascia plication described by Hamas. As I perform the incision of the temporoparietal fascia, I always notice a spreading of the two edges with a relatively fixed caudal flap and a cephalic flap that can easily be brought up. Anchoring on a solid

structure such as the temporal fascia will guarantee its persistence. Moreover, there is no backward displacement of the hairline, as mentioned by Hamas. This maneuver brings about a true wavelike movement that will maintain its position as the subjacent tissues are brought up. By using endoscopy I am able to avoid the long scar of the coronal lift, the temporal branches of the face lift and, most of all, excessive scalp resection.

The most cleverly performed temporal lift inevitably results in scars, even if there is no temporal alopecia. I prefer the 4 cm incision that allows use of the cold light retractor, although I could manage without it. It is a time-saving procedure, and there is no hair loss and no tension that could cause alopecia when the incision of the fascia is made in front of or posterior to the hairline. The different planes of dissection allow an anatomic approach and help to manage wrinkling in the temporomalar area, but this technique does not totally treat the malar bags. In the few unsatisfactory results in our series, the tail of the brow was inadequately lifted.

On the other hand, the improvement is spectacular in the temporomalar region, where the fine tissues exhibit fine wrinkles, and at the lower lid, where one can resect a strip of wrinkled skin with impunity. It is an excellent method for preventing and sometimes correcting a round eye, and there will be no need for adjunctive chemical peel therapy or laser resurfacing.

COMPLICATIONS

In our series five unilateral hematomas occurred; these were drained under local anesthesia. These cases were from the first 30 patients in this series. All of these hematomas resulted from blood diffusion, and no hemostasis was required following these cases. I now apply ice for several hours, and I have not had a hematoma since. Four cases of transient alopecia were seen when the temporoparietal fascia incision was performed under the scalp. From the twentieth case onward, the fascial incision was made at least 1 cm or more in front of the hairline, and no alopecia has been reported since. Although no permanent paralysis of the temporal branch of the facial nerve was seen, eight patients had weakness of the frontalis muscle that lasted from 3 weeks to 2 months. Unlike other complications, these were seen in recent cases and certainly occurred because of more rapid dissection and excessive stretching.

CASE EXAMPLES

Aesthetic Analysis

This 32-year-old woman presented with lateral brow ptosis without excess skin at the level of the upper lid. There were no fat pads, but the skin of the lower lids was lightly wrinkled. The patient looked sad and inexpressive.

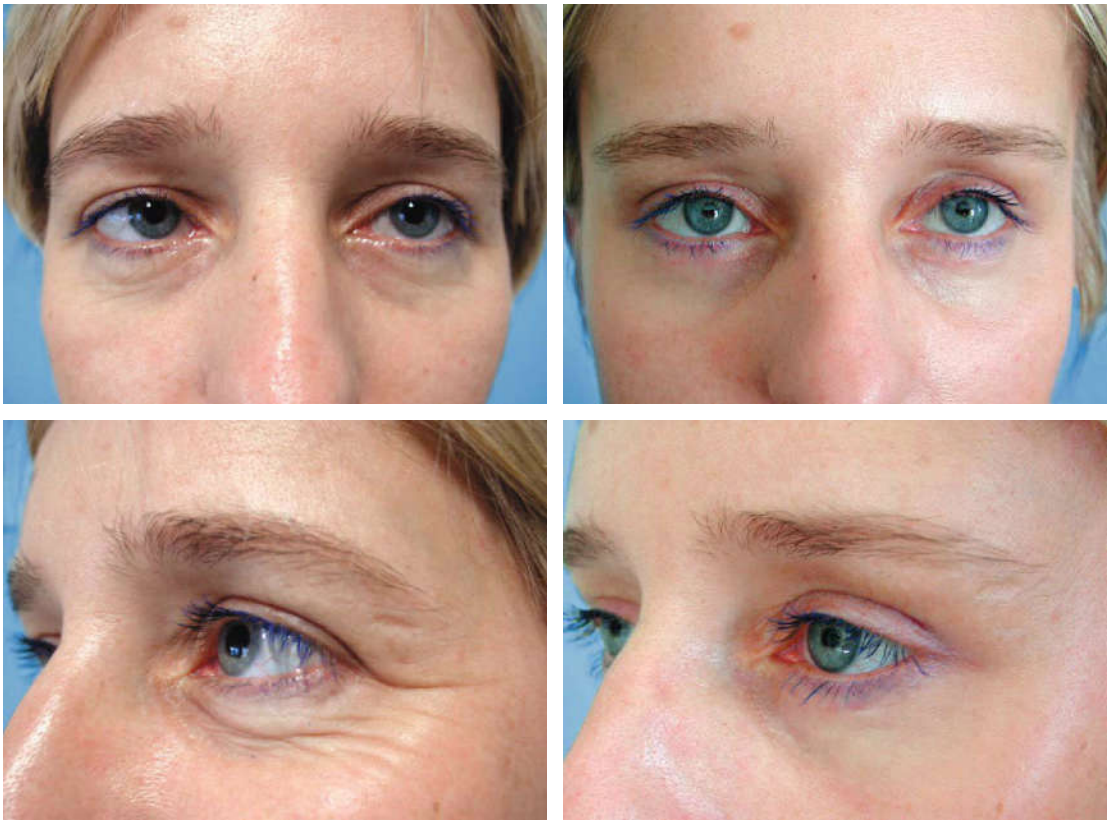
Surgical Plan

The treatment consisted of:

- A temporal lift with temporoparietal fasciapexy to the superficial temporal aponeurosis
- A lower eyelid pinch blepharoplasty

Postoperative Results

The results are shown 6 months postoperatively. The distance between the patient's eyelashes and brow has been increased. She has a happier expression. The redraping of the malar area and lower lid skin permitted the removal of a thin strip of skin without the danger of round eyes.



Aesthetic Analysis

This 52-year-old woman presented with moderate brow ptosis, blepharochalasis, shortening of the distance between the brows and eyelashes, and round eyes with scleral show.

Surgical Plan

The treatment consisted of:

- An upper blepharoplasty (preoperative markings of the skin excision are done while the elevation of the lateral part of the brow is simulated)
- A temporal lift with a temporoparietal fasciapexy previously incised to the level of the superficial temporal aponeurosis

Postoperative Results

The results are shown 9 months postoperatively. The distance between her eyelashes and brows is increased. Improvement is significant, because the procedure corrected the round eyes. No canthopexy was done. The upper lid scar does not extend too far laterally because of the temporal lift, which redistributed the extraorbital skin excess.

Aesthetic Analysis

This 53-year-old woman had marked signs of periorbital aging with crow's-feet, a moderate degree of blepharochalasis, an upper lid nasal fat pad, and noticeable skin excess at the level of the lower lid at an equal distance between the lower ciliary border and the orbital rim.

Surgical Plan

Chronologically, the treatment consisted of:

- A temporal lift to raise the lateral part of the brow and to redrape the skin of the crow's-feet and the malar region
- An upper blepharoplasty with resection of extra skin and of a strip of septal fibers of the orbicularis oculi muscle and removal of nasal fat
- A face lift and neck lift
- A lower eyelid pinch blepharoplasty

Postoperative Results

The results are shown 14 months postoperatively. The frontal and oblique views show a natural, stable result without modification of her look or of the hairline. The temporal and lid scars are not visible. Note the good definition of the upper lid pleat, correction of the crow's-feet, and redraping of the malar and lower lid skin. The poor quality skin of the lower lid was directly excised 8 mm from the cilia. One must not hesitate to incise the skin at this level; the scars are never visible with this quality of skin.

Aesthetic Analysis

In this 59-year-old woman, the aging process had significantly changed her appearance. She had a small scleral show; her brow was very high because of the permanent contraction of the frontalis muscle. This phenomenon is a compensatory reaction to blepharochalasis, which impairs the eyesight. She had moderate fat bags and fine rhytids in the lower eyelids.

Surgical Plan

The treatment consisted of:

- A combined approach to the lower lid: at the beginning of the operation, a transconjunctival approach was used that permits very moderate removal of fat bag; at the end of the operation, a pinch blepharoplasty was done
- An upper blepharoplasty with resection of the skin and orbicularis oculi muscle and removal of nasal fat (the marking of the skin excision is done while elevation of the lateral part of the brow is simulated)
- A temporal lift with a lateral traction to give a horizontal direction to the brows and to redrape the skin of the lower lid
- A face lift and neck lift by skin and platysma muscle anchoring (SPMA)

Postoperative Results

The results are shown 18 months postoperatively. The patient looks more serene. The position of the brows is more harmonious. The distance between eyelashes and brows is reduced. The improvement is very significant because of the procedure that corrected the round eyes. No canthopexy has been done. The resection of the extra skin without tension on the ciliary border must be done at the end of the procedure. Indeed, the temporal lift and the face lift bring more skin at the level of the lower lid. On the profile view, the upper lid is well defined and the look is more clear.

Aesthetic Analysis

This 49-year-old woman wanted to look refreshed and less tired. The shape of her brows and the distance between the eyelashes and brows were correct, but the excess of skin of the upper lids was significant, asymmetrical, and extended far laterally. The wrinkles of the crow's-feet were deep and visible. She had fine rhytids and no fat bags in the lower eyelids.

Surgical Plan

The treatment consisted of:

- A temporal lift with lateral traction to redrape the skin of the temporal area after freeing the skin from the orbital fibers of the orbicularis oculi muscle and to exert a tension on the lower lid skin
- An upper blepharoplasty with resection of skin and a strip of orbicularis oculi muscle and removal of nasal fat. As usual, the marking of the skin excision is done while the elevation of the lateral part of the brow is simulated. A complementary triangular resection of the orbital fibers of the orbicularis muscle is performed laterally to weaken the muscle contraction.
- A pinch skin resection at the end of the operation

Postoperative Results

The results are seen 22 months postoperatively. The patient no longer appears tired and has a rested appearance. The position of her brows has not been modified. Because of the temporal lift associated with the lateral resection of orbital fibers, the crow's-feet have disappeared and only a few fine and natural rhytids persist at the level of the lower lid without modification of her look. The upper lid is well designed. Note that the lid scars do not extend too far laterally out of the orbital rim.

Aesthetic Analysis

The case of this 41-year-old woman was very interesting. She looked like her father, with a genetically low position of her brow tail and blepharochalasis. The skin of the upper lids lay on the eyelashes and covered the lateral canthus. Her sight was restricted laterally, and the wrinkles of the crow's-feet progressively became folds. The eyes were permanently half-closed. She also exhibited considerable skin excess of the lower lids without fat pads.

Surgical Plan

The treatment consisted of:

- A temporal lift with a strong tension on the brow tail to elevate the lateral part of the brow and redrape the skin of the temporal area, with disappearance of the skin folds
- An upper blepharoplasty with large resection of skin and a strip of orbicularis oculi muscle and removal of nasal fat. As usual, the marking of the skin excision was done while the elevation of the lateral part of the brow was simulated. A complementary triangular resection of the orbital fibers of the orbicularis oculi muscle was performed laterally to weaken the muscle contraction. At the end of the operation, a pinch skin resection permitted removal of a 5 mm–high skin strip.

Postoperative Results

The results are shown 20 months postoperatively. Her brows are now well located; their elevation absorbed a part of the extra skin of the temporal area. The patient's appearance is greatly improved, and her eyesight is no longer restricted. Note that, even in this case, the lid scars do not extend too far laterally.

Surgical Pearls

- This technique can be used as an isolated procedure or in conjunction with an associated technique.
- No scalp resection is required.
- The result is natural and there is no backward movement of the hairline.

BIBLIOGRAPHY

Dardour JC, Ktorzat T. Endoscopic deep periorbital lifting: Study and results based on 50 consecutive cases. Aesthetic Plast Surg 24:292-298, 2000.

Fogli A. Temporal lift by galeapexy: A review of 270 cases. Aesthetic Plast Surg 27:159-165, 2003.

Hamas RS, Rodrich RJ. Preventing hairline elevation in endoscopic brow lifts. Plast Reconstr Surg 99:1018-1022, 1997.

Hester TR, Codner MA, McCord CD. Subperiosteal malar cheek lift with lower blepharoplasty. In McCord CD, ed. Eyelid Surgery: Principles and Techniques. Philadelphia: Lippincott-Raven, 1995.

Isse NG. Endoscopic facial rejuvenation: Endoforehead, the functional lift. Aesthetic Plast Surg 18:21-29, 1994.

Knize DM. A study of the supraorbital nerve. Plast Reconstr Surg 96:564-569, 1994.

Marchac D. [Preservation of the hairline in face-lifts by double temporal and retroauricular rotation flaps] Ann Chir Plast Esthet 37:519-524, 1992.

McCord CD Jr, Shore JW. Avoidance of complications in lower lid blepharoplasty. Ophthalmology 90:1039-1046, 1983.

Nahai F, Eaves FF, Bostwick J III. Forehead lift and glabellar frown lines. In Bostwick J III, Eaves FF, Nahai F, eds. Endoscopic Plastic Surgery. St Louis: Quality Medical Publishing, 1995.

Psillakis JM, Ramley TO, Camargos A. Subperiosteal approach as an improved concept for correction of the aging face. Plast Reconstr Surg 82:383-394, 1988.

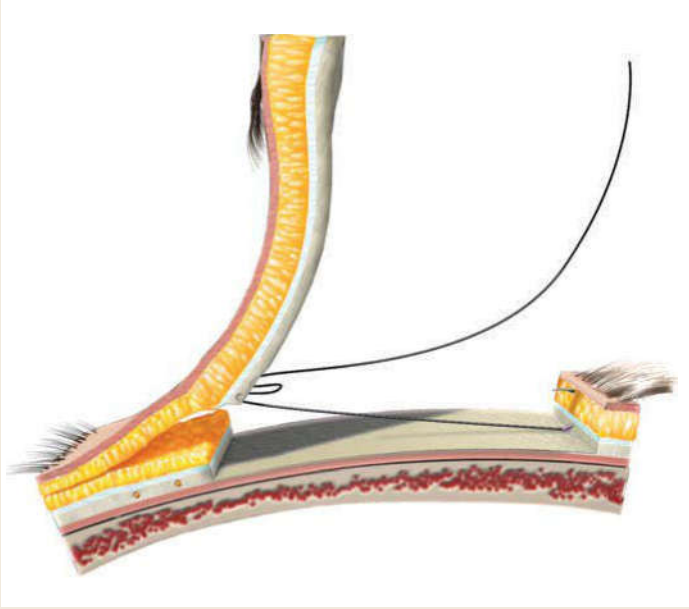
Ramirez OM. Endoscopic techniques in facial rejuvenation: An overview. Aesthetic Plast Surg 18:141-147, 1994.

Chapter

9

Combining the MACS-Lift With the Temporal Lift

Alexis M. Verpaele • Patrick L. Tonnard



Although we have been generally satisfied with the correction of the lower two thirds of the face provided by the MACS-lift, in some patients the result seemed incomplete because of the remaining ptosis of the lateral brow and temporal region. The simple MACS-lift corrects the lower third of the face. This includes the cervicomental angle and platysmal bands by cranial tightening of the platysma, jowls, marionette grooves, and to some degree the downward slant of the corners of the mouth. In addition, the midcheek hollow is corrected by vertical repositioning of the lower cheek volume.

The extended MACS-lift also provides an effective midface lift through the third malar purse-string suture. This corrects the nasolabial folds, adds volume in the zygomatic area, shortens the vertical height of the eyelids, and blends the eyelid-cheek junction.

The overall effect of the MACS-lift cranially reaches to the intercanthal line and lifts facial tissues into the upper cheek and malar region. This vertical displacement of facial tissues causes an obvious bunching of skin in the lateral part of the lower eyelid and paracanthal region, which needs to be resected. At the end of an extended MACS-lift, a pinch blepharoplasty is mandatory.

In many patients, facial aging is evident not only in the lower two thirds of the face, but also in the upper third, the brow, and the frontal region. This has traditionally been addressed by a classic brow lift, which can be carried out at a subperiosteal or subgaleal level, or else at a subcutaneous level. The lift at the subperiosteal or subgaleal level has traditionally been performed through an open bicoronal approach, or in recent years with endoscopic techniques. The subcutaneous approach necessitates a prehairline incision. The advantages of these traditional techniques are a predictable and consistent outcome and a low rate of complications. The disadvantages include long scars, possible alopecia, sensory changes with the open bicoronal technique, and problems with the fixation method in the endoscopic technique. Moreover, in a traditional brow lift there is a danger of overcorrecting the medial part of the brow, often resulting in an unnatural “astonished” appearance. It is an aesthetic misconception to pull the whole eyebrow upward. Many very attractive young women have a remarkably low position of the medial part of the eyebrow, but an elevated tail of the brow, with a clear, open paracanthal region.

The position of the eyebrows in this 27-year-old model is lower medially than laterally. The shape of the eyebrows is not arched, but almost horizontal and straight. The paracanthal area is crisp and open, with absolutely no hooding.

In most cases, the most evident sign of brow aging is a hooding of the lateral third of the eyebrow, often combined with horizontal wrinkles and folds in the paracanthal region. To preserve or restore facial harmony it is necessary to include this region in the facial rejuvenation surgery.

It is our conviction that currently only the lateral brow needs a surgical correction because the middle third of the forehead can very easily be corrected with botulinum toxin injections. In our practice we have seen needle surgery by botulinum toxin injections replace knife surgery by endoscopic or open forehead lifts. Since the introduction of botulinum toxin as a very elegant treatment modality for glabellar and frontal grooves, there has been a clear shift in the indications for brow lift toward a pure temporal lift.

There are three issues in temporal lifting:

1. To avoid damaging the frontal branch
2. To avoid altering the position of the hairline
3. To obtain a good and stable result

Myriad techniques exist that use a subperiosteal, subgaleal, or subcutaneous dissection plane, or a combination of these. The technique of Alain Fogli allowed us to continue working in a simple way, without worrying about the frontal branch, and with remarkably stable long-term results.

As we gained experience, we further simplified his technique, limiting the dissection to the subgaleal and subcutaneous planes, omitting the subperiosteal part of the surgery. We also modified the orientation of the incision to a more horizontal direction to better deal with the paracanthal and temporal skin excess created by the vertical lifting in the extended MACS-lift.

INDICATIONS AND CONTRAINDICATIONS

Following are two major indications for a temporal brow lift:

1. Preexisting temporal hooding or ptosis of the tail of the eyebrow. This consists of horizontal folds in the paracanthal region extending into the temporal area. The temptation to correct this with an upper blepharoplasty is great but absolutely wrong, because this would instead pull down the eyebrow tail, counteracting the desired rejuvenation.
2. The predicted likelihood that as a result of a significant vertical lifting, a gathering of skin in the temporal region will appear, which cannot be redistributed in the paracanthal area alone. In most cases this can be anticipated in the preoperative consultation with the patient in front of the mirror. If too much skin redundancy appears in the paracanthal area when simulating the vertical lift, the patient will need to be counseled about the necessity of the temporal lift.

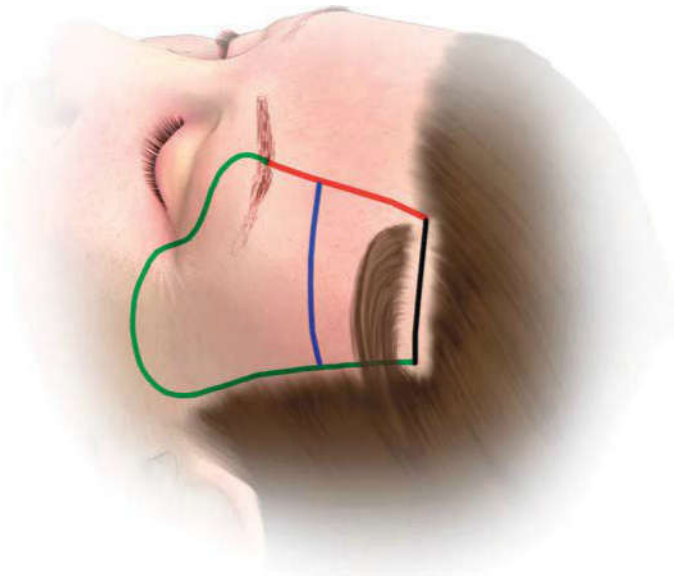
Contraindications are very few. A man with baldness or a very receding temporal hairline may present a challenge for the placement of the skin incision. However, this is the same for any brow-lift technique.

OPERATIVE TECHNIQUE

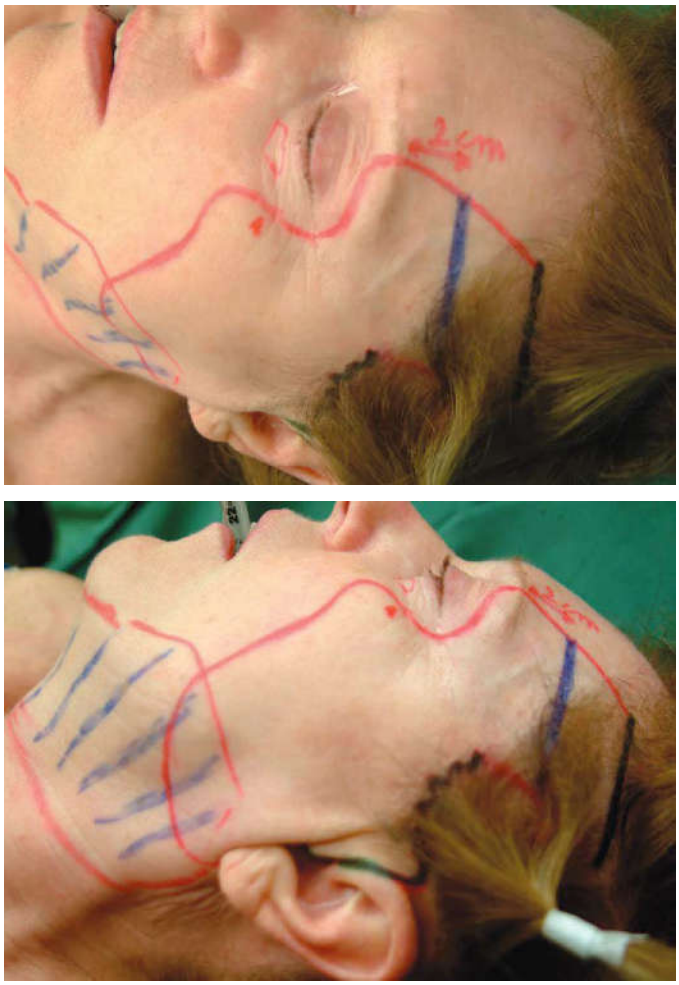
Key Elements

- Horizontal orientation of the skin incision
- Subcutaneous skin undermining through the MACS-lift incision
- Transection of the galea to change from a subgaleal to subcutaneous plane at a level 2 cm above the eyebrow
- Undermining of the tail of the eyebrow in the subcutaneous level toward the middle of the eyebrow
- Suspension of the cranial edge of the transected galea to the cranial galea at the skin incision with two U-shaped Vicryl 2-0 sutures
- Resection of a few millimeters of skin to minimize skin bulges
- Suturing with a running 3-0 nylon suture material
- Suture removal within 6 days

Markings

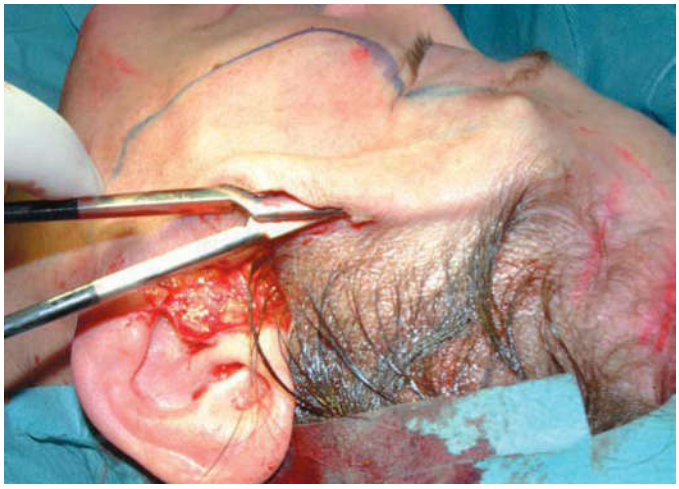


First, the medial border of the area to be undermined is marked as a curvilinear line *(red)* medial and parallel to the temporal crest, from the midpupillary line upward to just behind the hairline. From here the 4 to 4.5 cm horizontal skin incision line is drawn laterally in the hair-bearing skin *(black)*. Parallel to the skin incision a second line is drawn 2 to 3 cm caudally *(blue)*. This is the marking of the transition of the subgaleal to the subcutaneous dissection plane. In most cases this will leave a zone of at least 2.5 cm between the tail of the eyebrow and the galeal transection to protect the course of the frontal branch of the facial nerve, which runs on the undersurface of the frontalis muscle. The dissection is not taken more medially than the midpupillary line to preserve the supraorbital vasculonervous bundle.



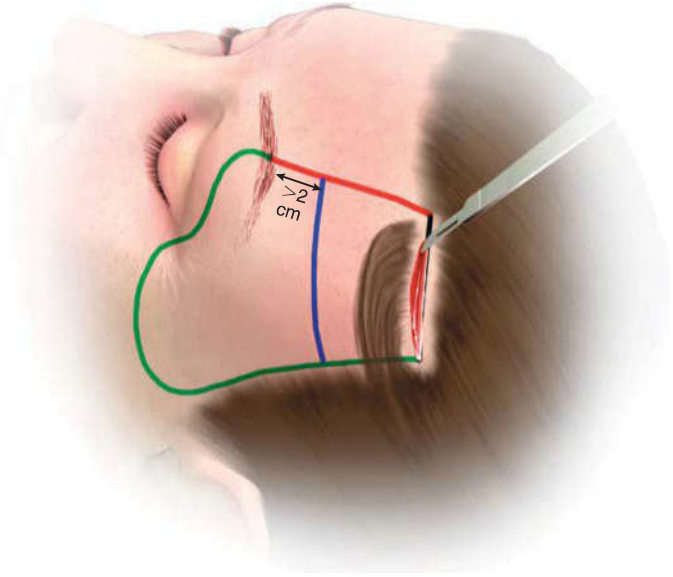
The lateral limit of the dissection is straight downward from the lateral end of the skin incision. The lower border of the dissection is in continuity with the subcutaneous MACS-lift dissection. If the brow lift is performed without a MACS-lift as an isolated procedure or in combination with an upper blepharoplasty, the lower limit of the dissection is the eyebrow and more temporally until below the lowest crow's-foot.

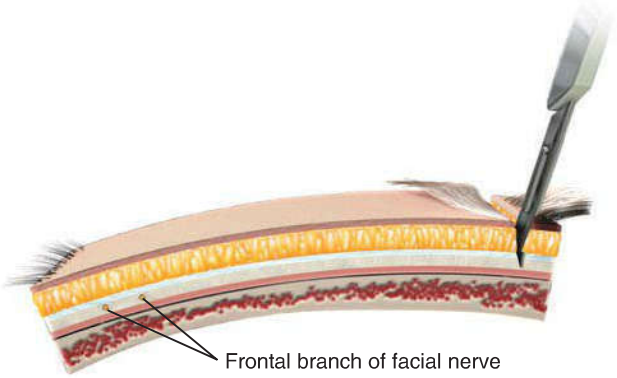
Dissection



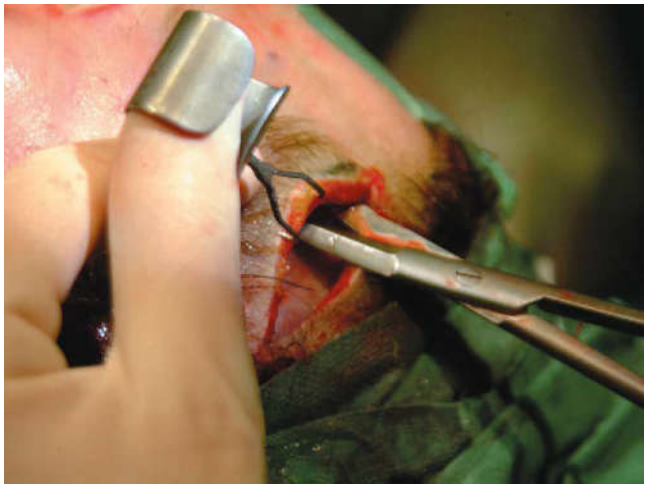
In most cases the temporal brow lift by galeapexy is performed in conjunction with a MACS-lift. This makes the subcutaneous dissection particularly easy, because it can be continued through the temporal prehairline incision mediocranially under direct visualization until reaching the demarcation line to the subgaleal plane. This part of the dissection is done together with the MACS-lift flap creation in the beginning of the surgery.

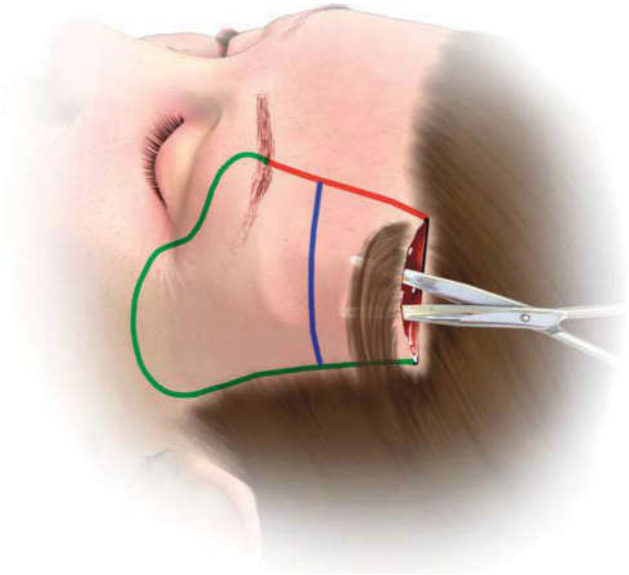
The rest of the temporal brow lift is performed immediately after placement of the MACS-lift purse-string sutures and before cheek skin redraping and resection. The brow lift reduces the dog-ear formation in the paracanthal and temporal region. This operative sequence is important for proper skin excess management.



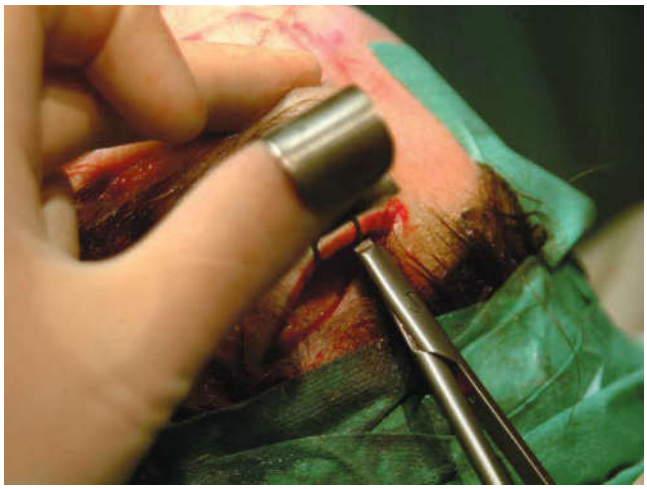


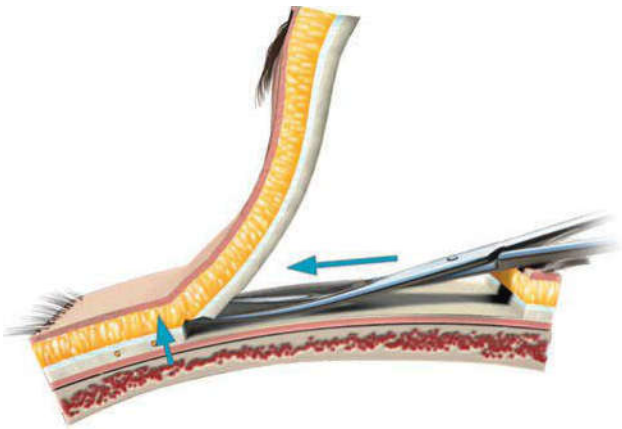
The skin incision, parallel to the hair shafts, is carried down through the skin and galea aponeurotica, to but not through the periosteum.





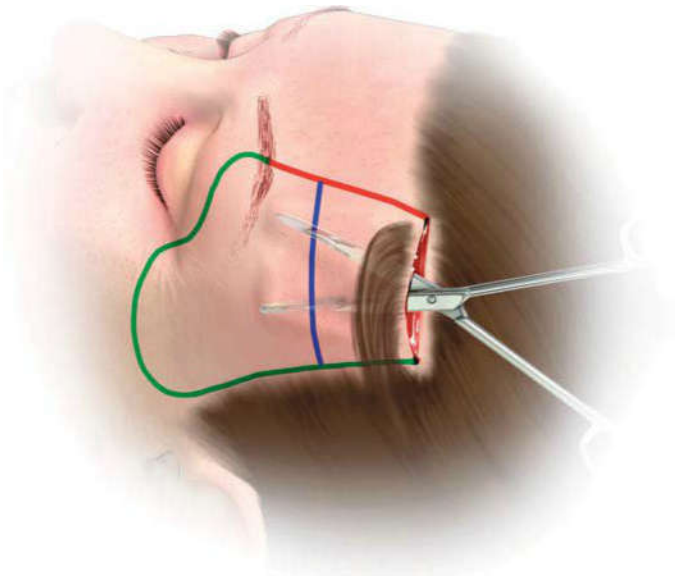
A subgaleal dissection is performed by spreading with face-lift scissors to the marking 2 to 3 cm below the skin incision. The bottom of the dissection plane is periosteum in the medial part and deep temporal fascia in the lateral part.

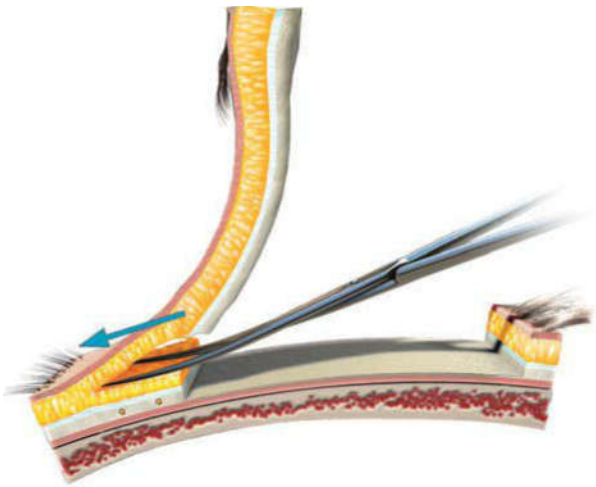




At the marking, the tips of the face-lift scissors are oriented upward and the galea is transected against digital palpation of the nondominant finger.

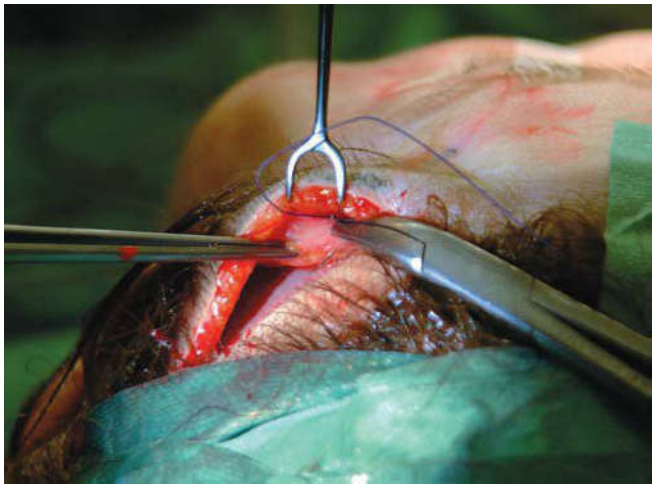
When the subcutaneous dissection is performed in conjunction with a MACS-lift, the subcutaneous plane that has already been created is found very easily. When performed as an isolated procedure, the subcutaneous dissection must be made from this galeal transection downward, taking care to stay in the pre-muscular level until one reaches the limits described previously. This involves undermining of the eyebrow. The dissection is not taken more medially than the midpupillary line to preserve the supraorbital vasculonervous bundle. Caudally, the subcutaneous dissection follows the lateral orbital rim and is carried out in the plane between skin and the orbicularis oculi muscle. The lower end of the dissection is the lowest edge of the crow's-feet.

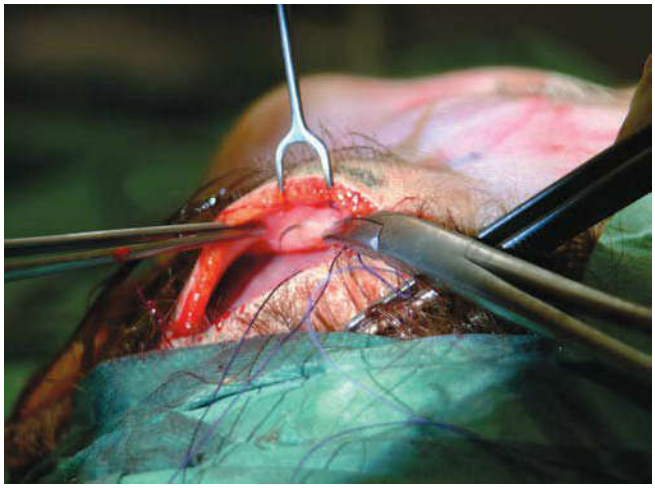


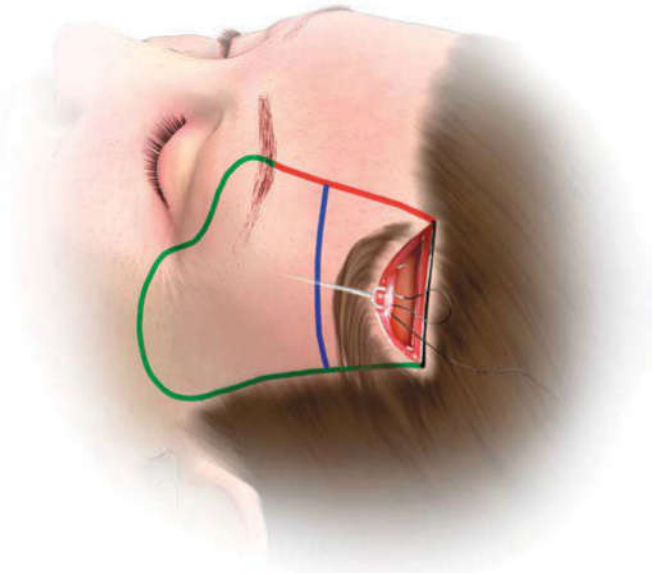


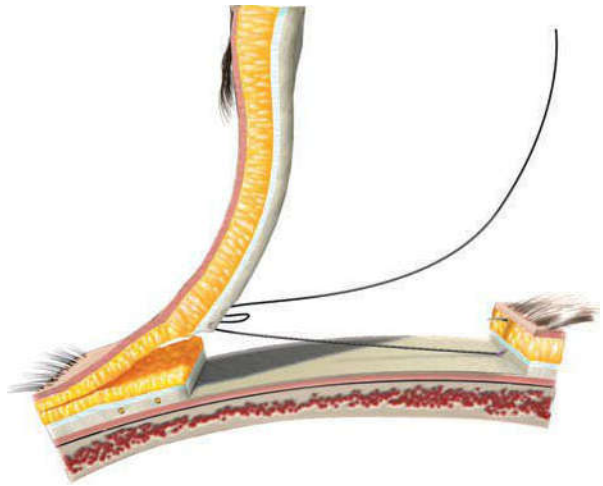
Hemostasis is ensured. The borders of the transected galea need the most attention, because sometimes a pulsating branch of the superficial temporal artery has to be cauterized.

Lifting

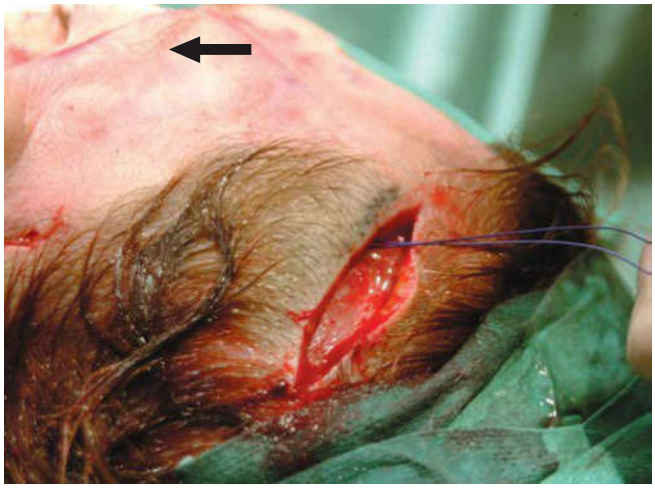
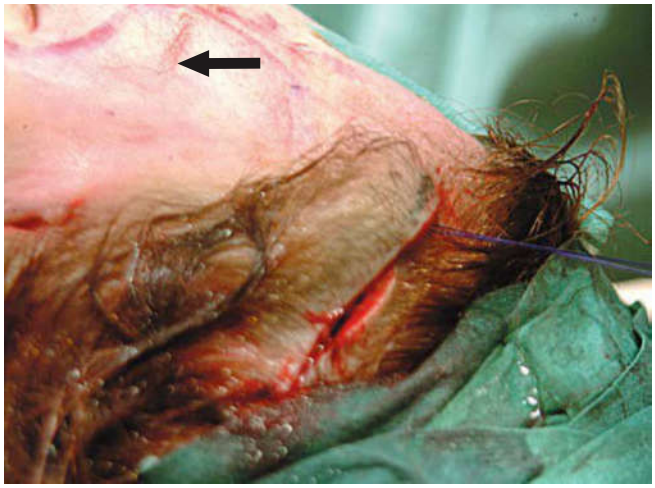
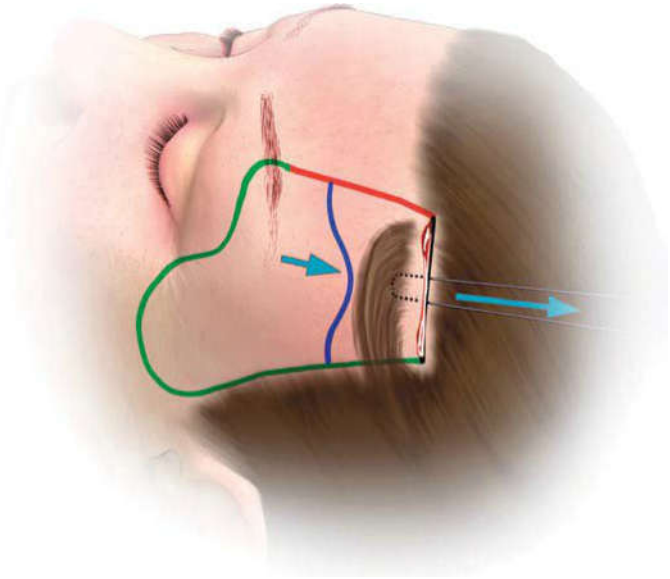




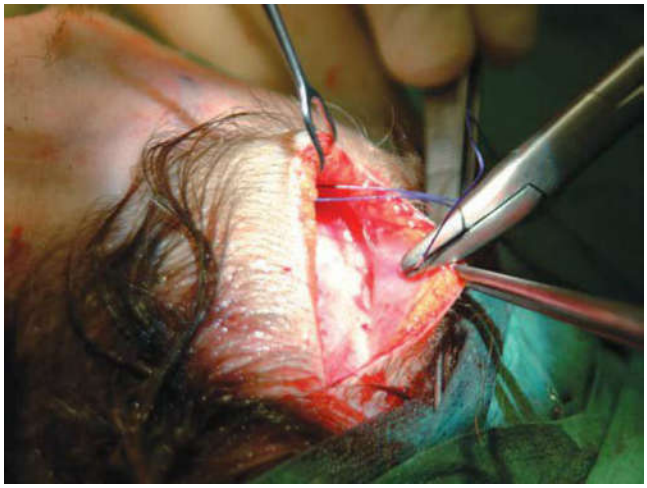


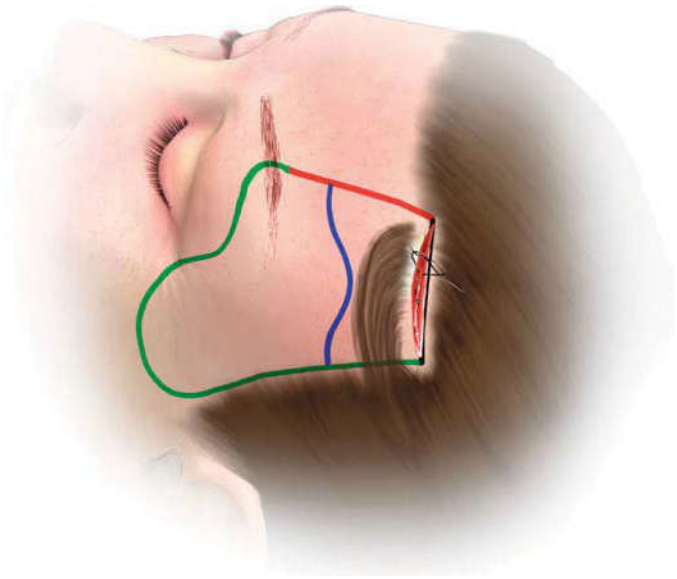


A 2-0 Vicryl suture on a small, round cutting needle (V5) is placed in the cranial border of the transected galea as a horizontal U-shaped suture (to prevent tearing through the galeal border).

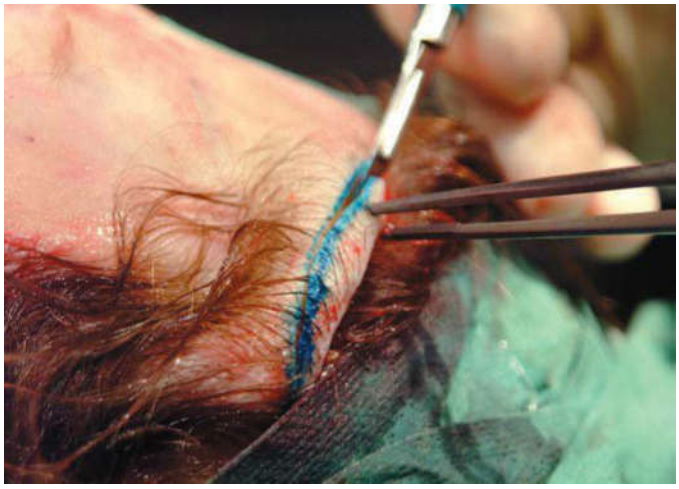

By pulling on this suture the efficiency of the eyebrow lift can be determined *(arrow)*.



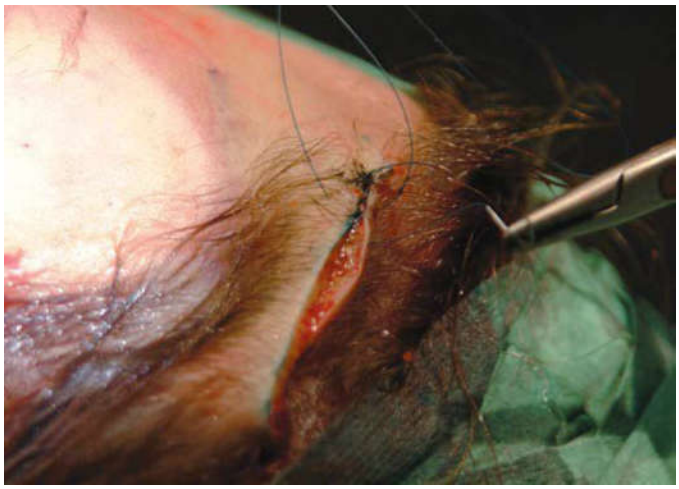


The suture is attached proximally to the galea at the skin incision, also in a U-shaped fashion. If the deep temporal fascia is seen, the suture can also be attached here. Two or three 2-0 Vicryl sutures are placed before tying.

The tying is done as the assistant pushes the temporal skin upward for maximal correction. A marked ridge becomes visible. This ridge will remain for about 6 weeks until the Vicryl suture loses its breaking strength. In the meantime, the subcutaneous scarring will have fixed the eyebrow in its new position.



Usually, a few millimeters of skin excess need to be resected, not for the stability of the result, but to diminish the height of the skin ridge.



The skin is closed with a running 3-0 nylon suture, which is removed on postoperative day 6 together with the face-lift sutures. As the skin edges are pushed together by the galeapexy sutures, there is absolutely no tension on the skin edges, and the scar quality is always excellent.

EXPERIENCE WITH THE MODIFIED TEMPORAL LIFT BY GALEAPEXY

We have been using this simple and effective technique for 3 years with growing enthusiasm in 118 patients. The majority (96) of procedures were performed in conjunction with a MACS-lift, and the remaining 22 as an isolated procedure. Initially, we applied Alain Fogli's technique unchanged, but as experience grew we eliminated the subperiosteal dissection, because this made the operation more tedious and less well-tolerated under local anesthesia in our hands (see Chapter 8). In accordance with our conviction that a facial rejuvenation should be as antigravitational as possible, the direction of the incision was changed from perpendicular to the temporal crest to strictly horizontal. This allows a purely vertical elevation of the eyebrow and paracanthal skin.

Basically, this technique is equivalent to a subcutaneous forehead lift without a skin excision, and limited to the lateral part of the forehead where most of the correction is needed. As a consequence, the hairline does not move and the incision does not show as it lies behind the hairline.

The whole procedure takes 10 minutes more time per side. It is simple, effective, and safe with regard to vascularity and the frontal branch of the facial nerve.

There is a short learning curve for the surgeon and few problems to be expected, even with limited experience. We had two undercorrections in our early series, probably caused by an insufficient undermining of the eyebrow. Limited sensory changes can be expected in some cases, because the horizontal incision crosses some sensory branches of the supraorbital nerve.

Another disadvantage is bulging of the skin in the frontotemporal area for 6 weeks postoperatively, which can easily be masked by combing the hair over the forehead. Only in patients with a very short haircut and in men with a receding hairline does the placement of the incision require a little more creativity.

Furthermore, thus far there have been no hematomas requiring surgical revision and no frontal branch problems.

The technique has many more advantages than disadvantages. In conjunction with the MACS-lift, it reduces the bulging of paracanthal skin. As a consequence, it reduces the length of the lower pinch blepharoplasty incision, especially the paracanthal extension, by taking over part of the vertical skin redraping. Therefore this temporal lift is currently added to a MACS-lift in more than two thirds of cases.

Many of our patients are resistant to brow lifting for fear of overcorrection. Nevertheless, the mechanism and the advantages of lifting only the tail of the eyebrow and the effect in the temporal and paracanthal region are easy to demonstrate to the patient in front of the mirror. Isolated or with a MACS-lift, it produces a very natural rejuvenation of the eyebrow-paracanthal region, without any risk of overcorrection. This stands in contrast to some subperiosteal techniques that can move tissues out of their anatomic location.

To conclude, this adjunctive technique fits perfectly with our philosophy of effective but simple interventions creating natural long-lasting results. It has a very comfortable position on the risk-benefit balance compared with many other techniques. In the spectrum ranging from aggressive subperiosteal bicoronal brow lifts to the suspension techniques without undermining, the temporal lift by galeapexy has become our primary choice for the correction of the upper one third of the face. In combination with the MACS-lift, it was the “missing link” toward harmonious facial rejuvenation.

CASE EXAMPLES

Aesthetic Analysis

This 53-year-old woman presented for facial rejuvenation. She was especially concerned about her neck and eyebrows. She had submental laxity with two heavy platysmal bands, some jowling, and marked nasolabial folds. The eyelid-cheek junction was starting to develop. The upper eyelids were hollow and the eyebrows low, producing a hooding in the lateral part of the eyebrow.

This procedure was done under local anesthesia with intramuscular midazolam relaxation (3 mg) and took 2 hours and 30 minutes. The patient was discharged 2 hours after surgery.

Surgical Plan

The treatment consisted of:

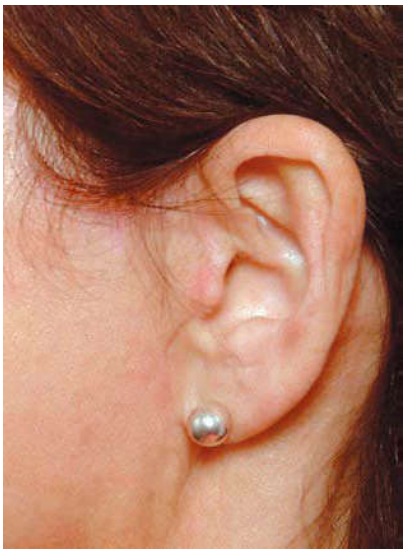
- Submental liposuction and suction of the jowls
- An extended MACS-lift
- A lower pinch blepharoplasty
- A short-scar temporal lift by galeapexy

Postoperative Results

The postoperative results are shown 6 and 12 months after surgery. On frontal view, the general shape of the face is changed from rectangular to more oval because of the tighter neck and correction of jowling. The two platysmal bands have disappeared. On the oblique view, improvement is seen in the better definition of the mandibular border, the softer nasolabial fold, and the better volume in the midface with correction of the infraorbital hollow. The lateral part of the eyebrow is in a higher position even after 12 months. The short-scar temporal lift has nicely rejuvenated the tired look without touching the upper eyelid skin. Performing an upper blepharoplasty would have been a wrong decision because of the low position of the eyebrows. Also in the profile view, the change in curvature of the entire eyebrow resulting from the temporal lift can clearly be seen. After 12 months, the position of the eyebrow is not changed. The change in cervicomental angle can also be seen in the profile view. Note that there is a minimal relaxation of the submental skin after 1 year. The quality of the scar in the preauricular and temporal hairline is good, permitting the hair to be worn behind the ear.

Preoperative | 6 months postoperatively | 12 months postoperatively

Preoperative | 6 months postoperatively | 12 months postoperatively



12 months postoperatively

Aesthetic Analysis

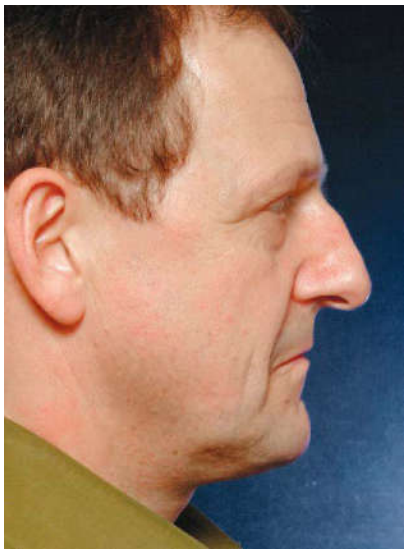
This 49-year-old man consulted for facial rejuvenation. He looked older than he felt and wanted maximal improvement. He had undergone an upper blepharoplasty elsewhere 5 years before. He presented with heavy, thick skin and general sagging of the face. He had some fatty infiltration of the submental region and ptotic jowls, deep nasolabial grooves, and a heavy fold on top of them. His midface was descended with a distinct crease between the cheek and the lower eyelid, which was bulging from the lower cilia toward the infraorbital crease. The upper eyelids were hollow and the eyebrow was heavy and in a low position. The tail of the eyebrow was drooping, causing a lateral hooding deformity with two or three deep horizontal creases in the paracanthal area. He showed deep horizontal wrinkles in the frontal area.

This procedure was done under local anesthesia with intramuscular midazolam relaxation (4.5 mg) and took 2 hours and 40 minutes. The patient was discharged 2 hours after surgery.

Surgical Plan

The treatment consisted of:

- Submental liposuction
- An extended MACS-lift
- A lower pinch blepharoplasty with transconjunctival resection of fat from the three compartments
- A short-scar temporal lift by galeapexy



Postoperative Results

The patient is shown 2 weeks and 9 months after surgery. He shows an adequate correction of the cervicomental angle, a better definition of the mandibular border with correction of the jowls, and a suspension of the submandibular gland by the cranial suspension of the platysma. The nasolabial groove is faded and the midface shows a natural replenishment, with almost complete eradication of the eyelid-cheek junction. The malar volume is in a higher position, giving a youthful malar augmentation effect that can best be appreciated on the oblique view. The effect of the temporal lift can also be seen on this view. The medial part of the eyebrow is in the same position as preoperatively, whereas the tail of the eyebrow is raised about 1 cm. This gives a natural fresher look without an "astonished" effect, which can be caused by the position of the medial eyebrow being too high. The close-up view of the scars shows their good quality. There is obvious hair regrowth through the temporal scar because of the tangential direction of the incision in that area. Using this technique, hair follicles are saved under the incision plane and regrowth starts a few months after surgery, sometimes causing cysts to appear as some hairs grow in. His beard and sideburns are still in an anatomic position in front of the ear and not out of the tragus, as is often seen after lateral traction on the cheek flap. The quality of the 4 cm horizontal scar from the temporal lift is perfect. This scar has never posed any problem, because skin is closed without any traction.

Preoperative

2 weeks postoperatively

9 months postoperatively

Preoperative 2 weeks postoperatively 9 months postoperatively

9 months postoperatively

Aesthetic Analysis

This 54-year-old woman consulted for facial rejuvenation. She was especially focused on her neck and her "look," which deteriorated significantly in recent years. She presented with a lax, fatty-infiltrated anterior neck, with two heavy platysmal bands. The jawline was interrupted by a heavy jowl from which a marked marionette groove ascended toward the corner of the mouth. She showed a moderate nasolabial fold and a descended midface, with a clear demarcation between the eyelid skin and the cheek skin. Her upper eyelid region was hollow with a low position of the whole eyebrow. At the lateral part of the eyebrow, the tail was ptotic and produced two or three deep folds known as *lateral hooding*.

This procedure was done under local anesthesia with intramuscular midazolam relaxation (3.5 mg) and took 2 hours and 50 minutes. The patient was discharged 2 hours after surgery.

Surgical Plan

The treatment consisted of:

- Submental liposuction and liposuction of the jowls
- An extended MACS-lift
- A lower pinch blepharoplasty
- A short-scar temporal lift by galeapexy

Postoperative Results

Postoperative results are shown 8 months after surgery. In the neck the cervicomental angle is markedly improved, with adequate correction of the platysmal bands, and better definition of the jawline, with correction of the jowl and marionette-groove deformity. In the midface, a nice effect on the nasolabial fold is seen, as well as a distinct lift of the malar volume (which is best appreciated in the oblique view) and a reduction in the vertical height of the lower eyelid with tightening of the lower eyelid skin. The lateral part of the eyebrow is in a higher position, correcting the lateral hooding. The "look" has been opened (close-up view), and the patient has a younger appearance. If a temporal lift had not been added to an extended MACS-lift procedure, the temporal hooding would not have been corrected or may have even been aggravated by the bulging of skin in the paracanthal region resulting from the vertical lift on the deep subcutaneous tissues and the skin. There was no retroauricular dissection, so there is no retroauricular scar.

Aesthetic Analysis

This 47-year-old woman presented for facial rejuvenation surgery. She smoked half a pack of cigarettes a day. This patient showed some fatty infiltration in the neck, moderate jowling, and marionette grooves. The midface was beginning to descend and had moderate nasolabial folds, some infraorbital hollow, and a downward curvature of the lateral aspect of the eyebrow. The medial part of the eyebrow was in a high position. She had hollow upper eyelids with no skin redundancy.

This procedure was done under local anesthesia with intramuscular midazolam relaxation (3 mg) and took 2 hours and 45 minutes. The patient was discharged 2 hours after surgery.

Surgical Plan

The treatment consisted of:

- Submental liposuction and suction of the jowls
- An extended MACS-lift
- A lower pinch blepharoplasty
- A short-scar temporal lift by galeapexy

Postoperative Results

The postoperative results are shown 1½ years after surgery. On the frontal view, a more youthful oval shape of her face and a higher position of the lateral part of the eyebrow are seen. These are better seen in the oblique and the lateral views. Note also the reduced jowling and marionette grooves and the faded nasolabial fold. The transition of eyelid skin into cheek skin is smoother. On the lateral view, the cervicomental angle is better but not perfect. A low digastric belly is probably showing through the skin. Although she had no temporal hooding, a temporal lift was suggested because of the thick skin bulging in the paracanthal region after a vertical face-lift maneuver was performed in front of the mirror.

Aesthetic Analysis

This 50-year-old woman presented for facial rejuvenation. She had a short haircut and was not willing to change this habit. She only wanted to have surgery if everything could be done under local anesthesia. She showed moderate neck laxity with some fatty infiltration, moderate jowling, and marionette grooves. The corners of her mouth slanted downward. The midface was beginning to descend with moderate nasolabial folds and a distinct eyelid-cheek junction. Her eyebrow was ptotic in the lateral part and some lateral hooding was visible in the paracanthal region.

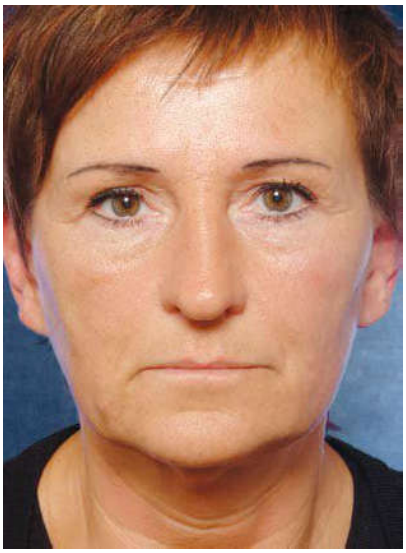
This procedure was done under local anesthesia with intramuscular midazolam relaxation (3 mg) and took 2 hours and 30 minutes. The patient was discharged 2 hours after surgery.

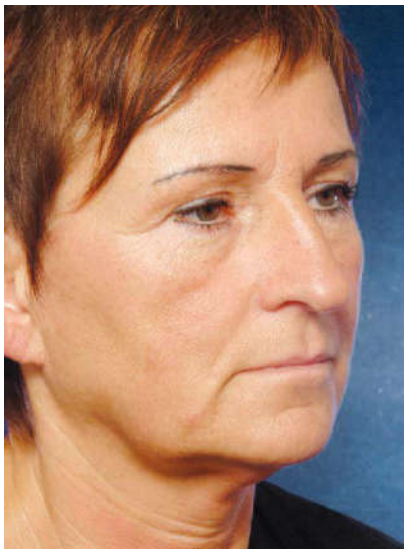
The patient had undergone an upper blepharoplasty with skin/muscle removal and emptying of the two fat compartments 5 years earlier at our facility. She also had a lower transconjunctival fat removal of the three compartments.

Surgical Plan

The treatment consisted of:

- Submental liposuction and liposuction of the jowls
- An extended MACS-lift
- A lower pinch blepharoplasty
- A short-scar temporal lift by galeapexy





Postoperative Results

The results are shown 12 months postoperatively. There appears to be a stable correction of the cervical laxity with sharpening of the cervicomental angle. Perhaps a digastric muscle is visible in the postoperative results, still obliterating the cervicomental angle. Correction of this would require opening the whole neck and removing at least a part of the muscle. This was not discussed with the patient, because it would turn the surgery into a major 3 to 4 hour intervention for which general anesthesia would be necessary. She shows an adequate and stable correction of the jowling and downward slanting of the mouth. The effect of the third purse-string suture on the midface is best seen on the oblique view. This effect can also be appreciated on the frontal and profile views. Her midface shows a general replenishment with a reduction of the vertical height of the lower eyelid and a fading of the eyelid-cheek junction. These results, combined with the correction of the temporal hooding by lifting of the lateral part of the eyebrow, achieve a naturally refreshed look. The quality of the final scar was good and the patient continued to wear her hair short.

Before blepharoplasty
(5 years before MACS-lift)

2½ months after blepharoplasty
(5 years before MACS-lift)

It is interesting to compare the preoperative and postoperative photographs of the eyelid surgery of 5 years ago with the preoperative and postoperative views after the additional midface and temporal lift 5 years later.

Surgical Pearls

- An upper blepharoplasty does not solve the problem of a ptotic eyebrow.
- Vertical lifting techniques such as the MACS-lift often generate a skin gathering in the paracanthal region that needs to be addressed.
- Needle surgery (botulinum toxin) has replaced knife surgery in the middle third of the forehead.
- The short-scar temporal lift by galeapexy is essentially a subcutaneous brow lift limited to the lateral third of the forehead.
- Overcorrection is virtually impossible, in contrast to subperiosteal lifting techniques.

BIBLIOGRAPHY

Fogli A. Temporal lift by galeapexy. A review of 270 cases. Aesthetic Plast Surg 27:159, 2003.

Isse NG. Endoscopic forehead lift: Evolution and update. Clin Plast Surg 22:661, 1995.

Knize DM. Limited incision forehead lift for eyebrow elevation to enhance upper blepharoplasty. Plast Reconstr Surg 108:564, 2001.

Matarasso A, Hutchinson O. Evaluating rejuvenation of the forehead and brow: An algorithm for selecting the appropriate technique. Plast Reconstr Surg 112:1467, 2003.

Moss CJ, Mendelson BC, Taylor GI. Surgical anatomy of the ligamentous attachments in the temple and periorbital regions. Plast Reconstr Surg 105:1475, 2000.

Paul MD. The evolution of the brow lift in aesthetic plastic surgery. Plast Reconstr Surg 108:1409, 2001.

Ramirez OM. The anchor subperiosteal forehead lift: From open to endoscopic. Plast Reconstr Surg 107:868, 2001.

Seckel BR. Facial Danger Zones: Avoiding Nerve Injury in Facial Plastic Surgery. St Louis: Quality Medical Publishing, 1994.

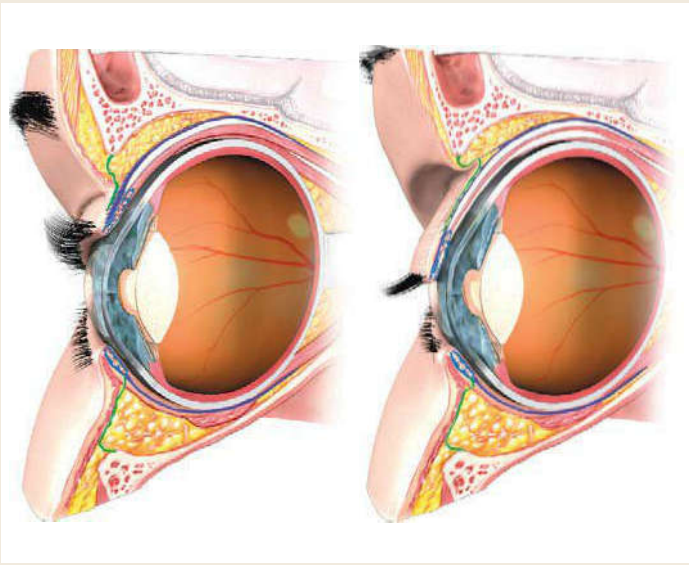
Chapter

10

The Synergy of Multimodal Facial Rejuvenation

Putting It All Together

Thomas L. Roberts III • Terrence W. Bruner
Thomas L. Roberts IV



Synergy suggests that the whole can be greater than the sum of its parts. As surgeons, we see a patient requesting a face lift, then we perform a face lift using our best skills and technique and (hopefully) get an aesthetically pleasing face-lift result. But did we obtain for our patient the most natural, harmonious appearance possible with a genuinely younger look? Although a good short-scar face-lift technique is the appropriate workhorse and anchor of many facial rejuvenations, it is possible that other, smaller simultaneous procedures, when well-thought out and implemented optimally, can in some cases have as much or more effect on the final result than the face lift. This concept is demonstrated by the patient pictured below.

Obtaining this quality of result with reasonable consistency requires (1) careful patient selection, (2) an understanding of the patient's goals and specific requests, (3) knowledge of ideal facial proportions (for the patient's specific ethnic group), (4) the ability to analyze the patient's less-than-ideal proportions and specific changes that come with the aging process, (5) familiarity with the different modalities available to accomplish facial recontouring and address the changes of facial aging, (6) insight as to which modalities to use for each patient and to what extent to develop the surgical plan, (7) the surgical judgment, experience, and skill necessary to implement the plan, and (8) the desire and ability (and staff) to nurture and support each patient through the vagaries of the healing process.

FIG. 10-1

Age 20 | Age 59 (preoperative) | Age 60 (postoperative)

UNDERSTANDING THE PATIENT'S REQUESTS AND GOALS

The patient's specific requests and general goals are key to obtaining the highest percentage of patients who are satisfied (or even extremely pleased) with their surgery. To understand what the aesthetic facial surgery patient really wants requires looking beyond his or her specific requests. Some patients tell us exactly which procedure or procedures they want (sometimes in excruciating detail). However, most patients know what they dislike about their face, have some ideas about what needs to be done, but seek our advice on the best solution to fit their needs and finances. Before discussing specific procedures, we need to understand the patient's expressed desires and unspoken or subconscious goals. Patients seeking facial aesthetic surgery generally fall into five groups, depending on their goals (if financial constraints were eliminated):

1. Patients who are somewhat timid regarding changes and might say, *"I want to look like myself, just a little less tired; a little younger would be nice."* Any change in these patients must be conservative and adhere rigidly to the limits the patient places. A small variation, even if it would look better, may cause an identity crisis and a very unhappy patient.
2. Patients who *"want to look the best possible—like I did when I was younger."* There may be a class reunion coming up or the wedding of a child or some other external motivation. It is crucial for the surgeon to find out if there are any such deadlines to ensure that there is enough time for recovery from surgery, as well as from possible complications. To miss these deadlines will bring the patient extreme frustration and embarrassment.
3. Patients who *"want to look better than I ever looked."* This group includes:
   - Those who have some facial disproportion (for example, big nose, weak chin, flat cheek bones, or thin lips) or simply a plain or homely appearance.
   - Those who have gone through (or are about to undergo) some major life transition and want a fresh start (for example, divorce, death of a spouse, a major career change, newly acquired resources that permit one to consider aesthetic surgery, or even retirement, which may offer the first opportunity to take enough time off to recover from surgery and remain out of the public eye for as long as desired). Of course, because of the emotional crisis of divorce or death of a spouse, it is prudent to wait (sometimes a year or more) before undertaking surgery.

     All patients wanting to look "better than I ever looked" also require a lengthy discussion of realistic expectations.

4. Patients who have *focused on one area* and have already decided they want a specific procedure, such as "lower eyelids."
5. Patients with *an exact limit on what they can spend* and want to know how to get the most effect for that expenditure.

For groups 1, 4, and 5, almost any good technique is appropriate. However, patients who want to look their very best (ideal facial proportions and contours and/or rejuvenation that is harmonious and natural) *require the best of our aesthetic sense, skills, and surgical judgment;* it is to these patients that this chapter is dedicated.

FACIAL REJUVENATION VERSUS FACIAL RECONTOURING

After the patient's specific request is understood, the next decision the surgeon must make is whether the patient requires facial recontouring or facial rejuvenation (or both). The difference in these concepts is significant and important. *Facial rejuvenation* is performed to restore facial features to their previous youthful look. *Facial recontouring* is performed to change or enhance the present features to make them "better than they ever looked." In other words, facial rejuvenation is the *restoring of beauty (for women) or of attractiveness (for men)*. Facial recontouring is the *creation of beauty or attractiveness*. These are, to some degree, two separate skill sets. It is challenging to bring about naturally harmonious rejuvenation, but it is even more difficult to create beauty where there is little or none.

Facial rejuvenation requires:

1. An old photo
2. An understanding of what the patient likes in the old photo
3. An understanding of the natural features of an attractive youthful face *(fullness, smoothness, and/or harmony of the features)*
4. The surgical skills necessary to obtain these goals
5. An understanding of the limitation of one's surgical techniques

Fig. 10-1 is an example of facial rejuvenation, the restoring of beauty.

Facial recontouring is for the patient who is *willing to risk looking different than he or she ever looked* (Fig. 10-2). It requires:

1. An understanding of aesthetic ideal proportions and contours (for the patient's ethnic group)
2. A perception of the areas where the patient's face varies from the ideal
3. A vision of what might be possible
4. Good communication with the patient to understand which parts of this vision the patient likes and dislikes (we prefer to include conservative computer imaging)

5. The surgeon must have the ability to think three-dimensionally—unlike painting, but similar to sculpting with clay and being able to add and subtract
6. The surgical skills to accomplish this vision and a knowledge of his or her limitations

FIG. 10-2

This patient demonstrates how beauty can be created with facial recontouring. She is shown preoperatively and 4 years postoperatively.

KNOWLEDGE OF IDEAL FACIAL PROPORTIONS AND CONTOURS

Leonardo da Vinci was one of the first people to understand and describe ideal facial proportions. Studying his work and that of others on this subject provides a helpful background and is a requirement for facial aesthetic surgery, but this information is only a "mental knowledge" until a surgeon can draw a well-proportioned (if generic) face from memory, in both frontal and profile views. This ability makes it so much easier to surgically create, for example, an attractive nose, lips, and chin that are in harmonious proportion to each other and bear distinctly masculine or feminine characteristics. Such a course on drawing the human face (and body) should be available as a night class at local colleges or art schools and is well worth the time invested and the small cost. This should be a part of every plastic surgery residency. Even more helpful is a course in sculpting.

It is not necessary to have any artistic talent to benefit from these courses. The goal is to make surgeons better at perceiving what they see. Until one tries to make a face from clay, there are hundreds of important facial characteristics that escape attention. How long should the upper lip be? How wide? How thick? How far anteriorly should it protrude relative to the nasal tip and chin? A surgeon who thinks he or she understands the ideal shape and proportion of an attractive male and female nose should try making one out of clay! Once this is mastered, one should try to build from clay an attractive face around the nose. It can be very humbling, but creates a "teachable moment"—the surgeon gains instant awareness of the need to know all those facial relationships and proportions that he or she has always seen, but never fully perceived.

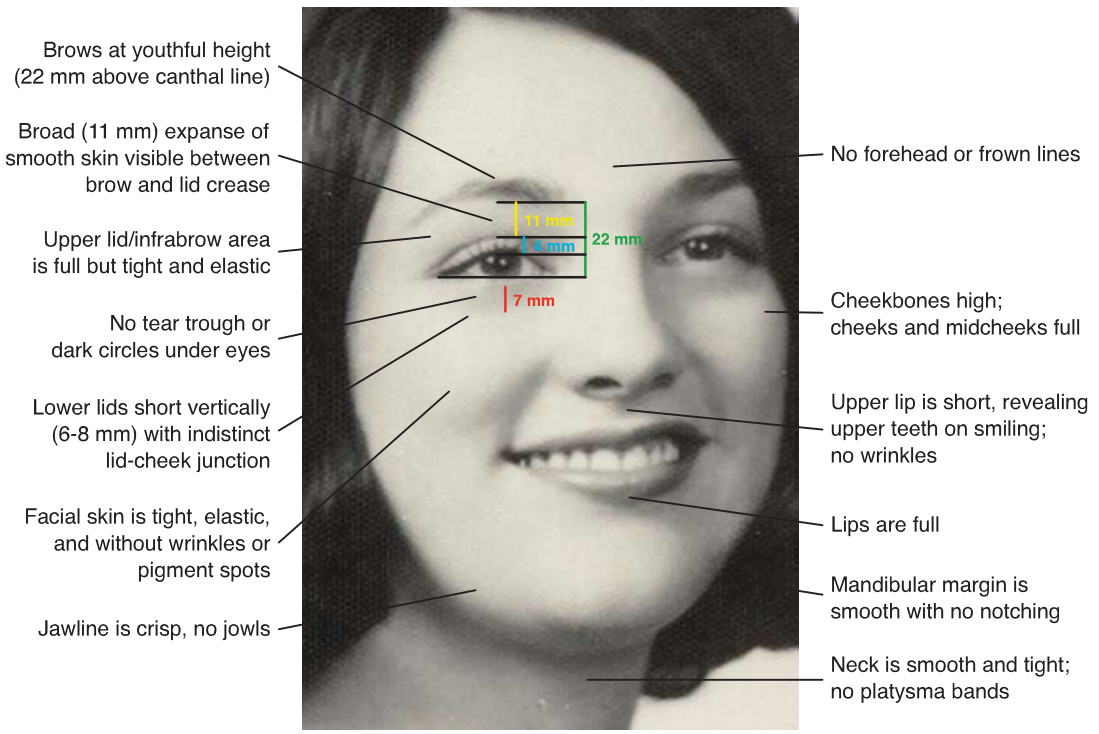
Sculpting with clay is very much like facial surgery. Being able to take away clay with a wire loop is like reducing a prominent jowl with liposuction; and now by microfat grafting we can add "clay" (for example, to augment the cheek bone or chin).

To understand aging, we must first be aware of the characteristics of the attractive, youthful face. Most of these features are well known to us, but the details of the periorbital area bear repeating because of their importance as goals for optimal, natural-looking rejuvenation. Tessier, the father of craniofacial surgery, stated that, philosophically, craniofacial surgery is *orbitocentric*. Aesthetic facial surgery shares roots with, and is in some ways an extension of, craniofacial surgery.

The characteristics of the youthful face include:

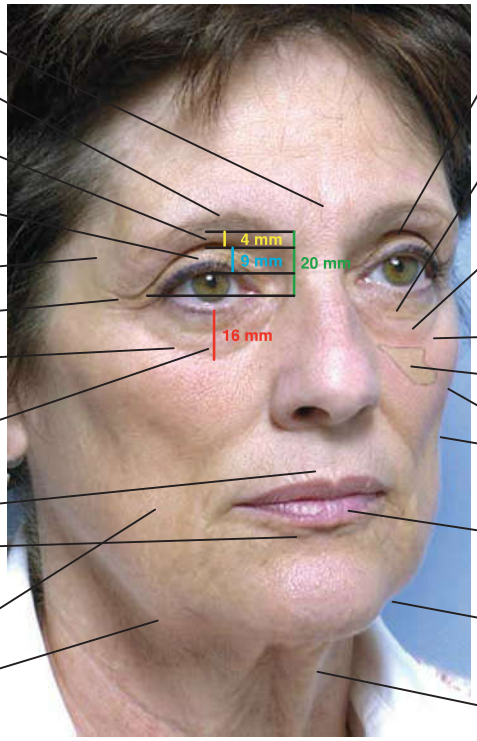
1. Brows at a youthful height, in this case (Fig. 10-3) 22 mm above the canthal line, as measured from a life-size photo. *It is important to recognize that our visual perception of brow height is more dependent on the amount of skin visible between the lid crease and the brow than the absolute height of the brow above the eyelid.* In other words, we read the height of the brow as its height above the dark shadow of the lid fold, wherever that may be.
2. The upper lid and infrabrow area in youth are full, not flat or sunken. Despite this fullness, youthful upper lids do not appear to have bags because their skin is taut and elastic.
3. The superior tarsal fold is only 6 to 10 mm from the lid margin in young women and men.
4. The lower lid margin should cut across the iris at approximately the 5 to 7 o'clock position; rarely will it be lower in youth unless the inferior orbital rim or the entire malar complex is hypoplastic.
5. The apparent vertical height of the lower lid should be only 6 to 8 mm, and the lid-cheek junction should be indistinct; that is, the lower lid and cheek should blend imperceptibly into each other.

FIG. 10-3



CHARACTERISTICS OF THE YOUTHFUL FACE

FIG. 10-4



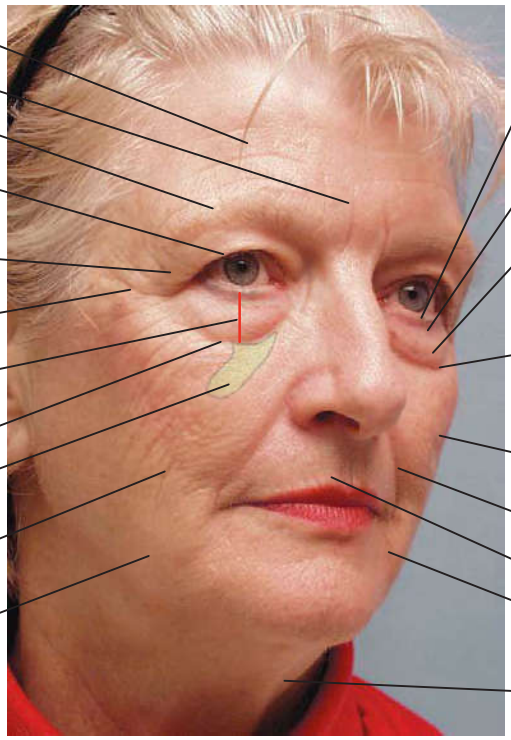
Frown lines develop
Brows become ptotic
7 mm (64%) decrease in skin visible between brow and lid crease
Increased show of pretarsal skin
Temples sunken
Crow's-feet wrinkles appear
Lid-cheek junction becomes distinct
Apparent height of lower lid is lengthened from 7 mm to 16 mm (230%)
Atrophy of perioral fat increases visibility of upper lip furrows (rugae) and causes irregular depressions and lines around lower lip
Facial skin is lax, empty
Jowls are primarily loose skin, minimal fat

Atrophy of orbital fat; upper lid becomes sunken (gaunt) and conceals much redundant skin
Dark circles of lower eyelid caused by shadows and hyperpigmentation
With atrophy of periorbital fat, lower eyelid bags are less pronounced
Atrophy and descent of malar fat reveals tear trough and malar-facial groove
Atrophy of midcheek fat makes cheeks bony and gaunt; face looks skull-like
Lips become thin, wrinkled, and "pruney"
Ptosis of skin around mandibular ligament causes notching of mandibular margin, making chin look pointy
Neck loosens and platysma bands develop

GAUNTING PATTERN OF AGING

See this patient's case presentation on p. 416.

FIG. 10-5



Transverse forehead lines develop
Vertical frown lines appear
Prosis of brow
Hooding of upper lid; pretarsal skin hidden
Wrinkling and crêpey changes in upper lid skin
Crow's-feet wrinkles develop
Apparent vertical height of lower lid increases
Lid-cheek junction becomes distinct
Malar-facial groove
Facial skin loosens, wrinkles and pigment spots develop
Ptotic midcheek fat creates jowls; jawline becomes indistinct

Laxity of lower lid margin and lateral canthal tendon may cause scleral show and/or lateral rounding or droop
Lower lid bags
Dark circles under eyes caused by shadows and darker skin
Soft tissue of cheek slides down, revealing tear trough, flattening the malar eminence, and accentuating the nasolabial fold
Midcheeks remain full, especially adjacent to nasolabial fold
Nasolabial fold deepens
Deeper wrinkles of upper lip (rugae)
Marionette lines appear
Neck skin loosens and platysma bands are visible

MOST COMMON PATTERN OF AGING

UNDERSTANDING THE VISIBLE CHANGES OF FACIAL AGING

Broadly speaking, there are two patterns of facial aging, as represented by the two patients shown in Figs. 10-4 and 10-5. With the *gaunting pattern of aging,* fat of the periorbital, temple, malar, midcheek, and perioral areas becomes atrophic despite normal weight, and laxity and wrinkling of the skin develop. With the *most common pattern of aging,* the face retains fullness but soft tissues become ptotic, and laxity and wrinkling of the skin develop. Signs that cannot be treated by face lift, brow lift, blepharoplasty, and rhinoplasty are *labeled in red*. The aesthetic plastic surgeon should become so familiar with these two patterns of aging that he or she can predict how a person looked 20 or 30 years ago, before even seeing an old photo. The facial aging process is not just the relentless relaxation and southward movement of skin and soft tissue in response to gravity, though this is usually an important factor. Rather, it is a complex result of bony changes, hereditary factors, sun damage, fixating ligaments that often yield (such as the lateral canthal tendon), and those that often relax less (such as the modeolus and the mandibular ligament). The excellent work of Lambros comparing superimposed images of aging faces over several years is well worth studying.

Changes Most Common to All Patterns of Aging

Forehead

1. Transverse wrinkles caused by frontalis muscle activity
2. Vertical or oblique glabellar frown lines and furrows caused by corrugator muscle action.

Frequently Seen Features in the Most Common Pattern of Aging

Periorbital Area (Fig. 10-5)

1. Brow ptosis
2. Ptosis of infrabrow soft tissues
3. Wrinkling and crêpey changes in upper and lower lid skin caused by orbicularis oculi activity (squinting and smiling)
4. Crow's-feet wrinkles and oblique wrinkles radiating out from the orbit to the lateral forehead, temples, and cheeks resulting from orbicularis oculi action (see Fig. 10-5)
5. Upper and lower eyelid bags
6. Hooding of the lateral upper lid

7. Dark circles under eyes caused by:
   - Shadows from overhanging eyelid bags
   - Dark skin resulting from actual hyperpigmentation or the dermal venous plexus showing through the thin, translucent lower lid skin
   - The shadows are deeper and darker if the sunken area of tear-trough deformity is present.
8. Atrophy and descent of the malar fat causes several changes in the periorbital area:
   - As the thicker malar fat descends from the inferior orbital rim, it leaves a sunken crescent covered with only a thin layer of skin and orbicularis oculi (the tear trough).
   - The oblique low bony area (called the *malar-facial groove* by Mendelson) between the malar eminence and the edge of the piriform aperture is revealed as the malar fat atrophies or slides down into the midcheek. (This area is lightly shaded and outlined in Figs. 10-4 and 10-5.)
   - The lid-cheek junction becomes distinct.
   - The apparent vertical height of the lower lid increases twofold or more as the malar fat descends.

Malar and Midcheek Areas

1. Descent and/or atrophy of malar fat causes:
   - Flattening of the malar eminence
   - Exaggeration of the nasolabial fold
2. Descent of midcheek fat and skin causes jowls to develop.
3. Facial skin loosens and ingrained wrinkles appear.

Perioral Area

1. Loss of bony height of the alveolus of the maxilla and mandible can give an edentulous appearance.
2. Wrinkles and deep furrows (rugae) develop on the upper lip.
3. Nasolabial creases deepen.
4. The upper lip may lengthen.
5. Marionette lines may develop.
6. Assorted lines and folds appear around the corners of the mouth and between the lip and chin.
7. The lips become thinner and atrophic.

Jawline

1. Ptosis of the chin pad develops.
2. Notching of the mandibular margin at the lateral chin is present, also making the chin look pointy. This notch is not a true bony notch but is caused by ptosis of the chin anterior to and of the jowls posterior to the mandibular ligament, which has not stretched.
3. There is descent of the jowls.
4. Bony resorption of the posterior surface of the ascending ramus of the mandible causes loss of the crisp angle of the jaw (gonial angle).
5. Submental fatty deposits can hide the margin of the mandible, especially posteriorly, making it indistinguishable from the neck.

Neck

1. Skin redundancy develops.
2. Submental fat develops.
3. Platysmal bands develop.
4. Subplatysmal fat deposits may appear or enlarge.
5. Submaxillary salivary glands may become ptotic.

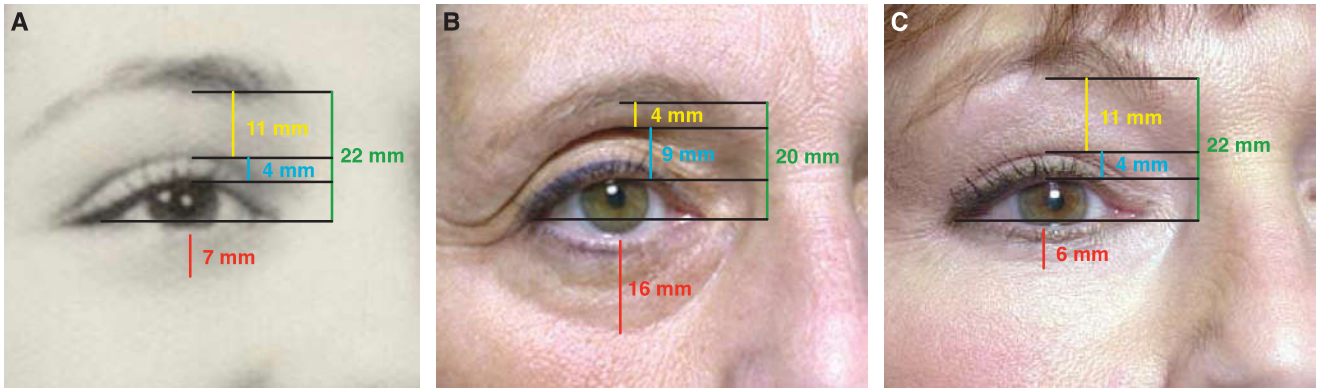
Changes Unique to the Gaunting Pattern of Aging
(see Fig. 10-4)

Atrophy of fatty tissues causing sunken appearance of:

- The temples
- The upper eyelids
- Midcheek
- Malar facial grooves
- The perioral area (causing depressions below the lips and around the commissures); result is a gaunt, unhealthy look (reminiscent of advanced HIV lipoatrophy), outline of skull almost visible through skin

The atrophy of fat in the upper lid and infrabrow has an unexpected effect, pointed out independently by Coleman and Lambros. This was my (T.L.R. III) first epiphany or *"aha" moment* in understanding facial aesthetics. Because we subconsciously judge the height of the brow as its distance above the upper lid crease, any change in the location of the lid crease or sulcus affects our perception of the brow's position.

FIG. 10-6



Age 20 | Age 59 (preoperative) | Age 60 (postoperative)

In the youthful face in Fig. 10-1, *A*, measurement of the brow to the crease in a life-size photo would reveal a height of 11 mm (see Fig. 10-6, *A*). The show of pretarsal skin is only 4 mm. By age 59 (see Fig. 10-1, *B*), the brow appears to have dropped dramatically, with a height of only 4 mm above the sulcus (see Fig. 10-6, *B*), a decrease of 7 mm or 64% from the youthful 11 mm. But our eyes are playing tricks on us. If we take a more reliable baseline to measure brow height, the intercanthal line, we find in youth her brow was at 22 mm and by age 59 has dropped only 2 mm, or 10%. Being at 20 mm above the canthal line, our error in perceiving too much drop of the brow occurred because the atrophy of the periorbital and infrabrow fat has revealed the previously obscured superior orbital rim, with only 4 mm of skin visible between the rim and the brow. The fat atrophy has also caused 9 mm of pretarsal skin to be visible, shifting the location of the apparent lid crease or sulcus upward by 5 mm (an increase of 225% more than the youthful 4 mm). Perhaps this exaggerated perception of brow ptosis is why we tended to place the brows too high in the early days of brow lift.

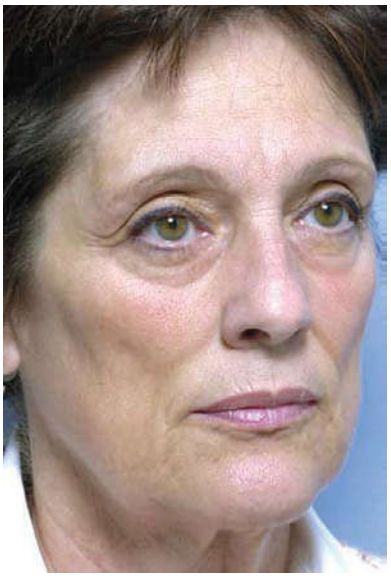
The patient in Figs. 10-4 and 10-8 represents a common form of aging known as *gaunting* (see a full case presentation of this patient on pp. 416-417). Her face was full in youth (see Fig. 10-3), and at age 59 she was in excellent health, free of all diseases including HIV, at ideal body weight, and had undergone no previous facial surgery. In addition to the usual laxity and ptosis of the soft tissues, her face demonstrated a noticeable degree of atrophy of fat (and possibly some muscle atrophy) in the temple, periorbital, malar, midcheek, and perioral areas. This gave her face an unattractive, *gaunt look, and the outline of the skull could almost be seen through the skin.*

This gaunting poses special problems in the periorbital area. The sunken upper lid requires a differential diagnosis: Is it atrophy of periorbital fat from this *gaunting pattern of aging* (Fig. 10-8), or is it the result of *levator dehiscence* (Fig. 10-7)?

FIG. 10-7

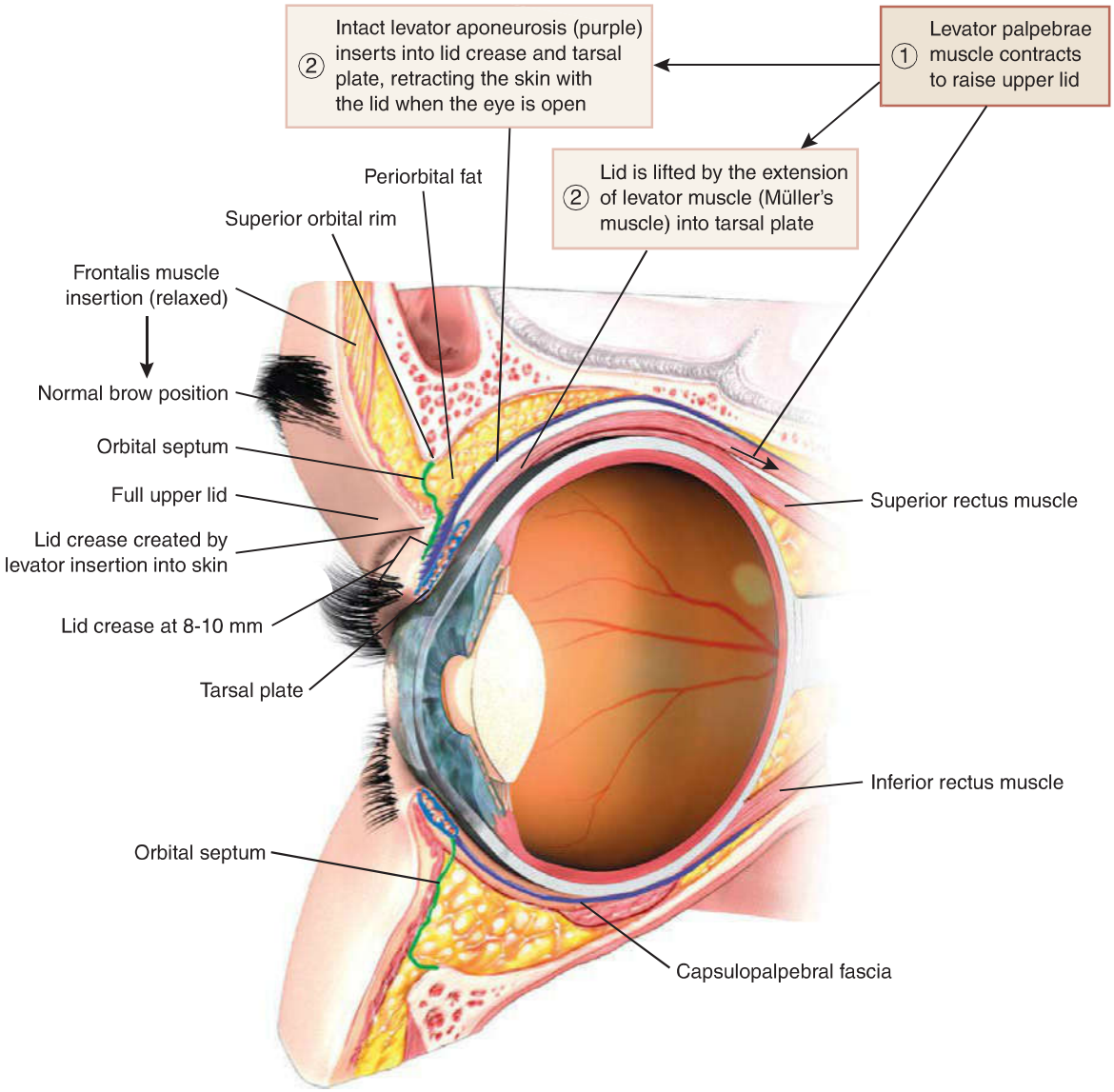
Sunken upper lid caused by levator dehiscence. This patient, shown at left in her normal relaxed appearance, has sunken upper lids and true ptosis of the upper lid margins. The lid margin partially covers the pupil; the brow position is only slightly higher than normal. On the right, a maximal effort to open her eyes results in the classic signs of levator dehiscence: (1) persistent ptosis of the upper lids (though less than in Fig. 10-7), (2) multiple deep transverse forehead wrinkles caused by extreme chronic contraction of the frontalis muscles in trying to lift the upper lid, (3) a resultant excessively high brow position, and (4) a sunken upper lid (see Fig. 10-9, *A* and *B*).

FIG. 10-8



Sunken upper lid caused by the gaunting pattern of aging. As described on p. 342, the upper lid position and function are normal in this patient, but atrophy of the infrabrow and periorbital fat causes a dark, sunken area just under the brow, giving the illusion of a significant drop of the brows. Contrast this low brow position with the overelevated brows in Fig. 10-7, *B,* and the differential diagnosis is easy.

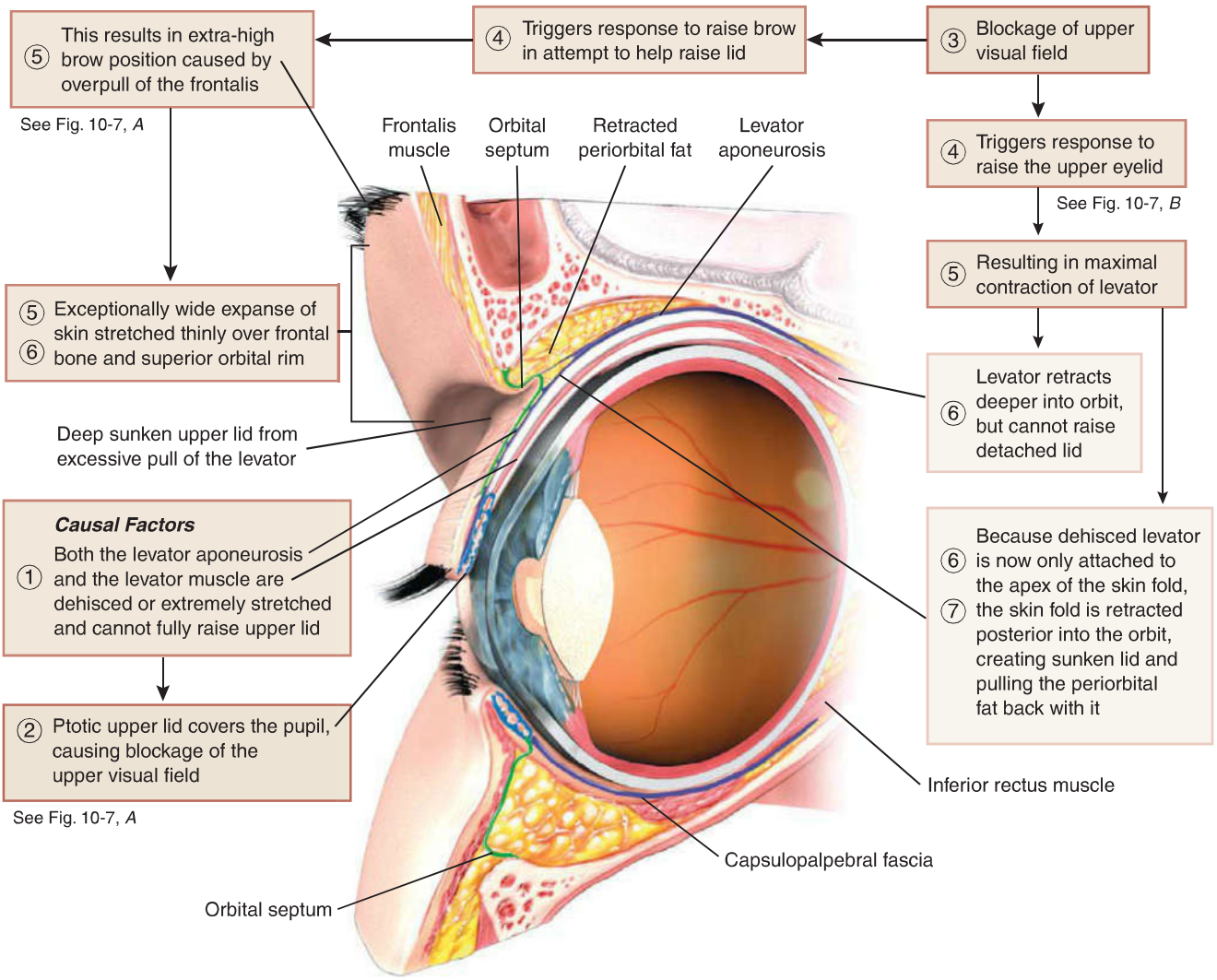
FIG. 10-9



NORMAL OPEN UPPER LID

In the normal upper lid, the levator aponeurosis is thin but strong. It lifts the lid quickly and for an extended period, with no conscious effort by the individual. In the gaunting pattern of aging, atrophy of the infrabrow and periorbital fat can result in a sunken upper lid. With loss of fat volume in front of and behind the orbital septum, the area of the eyelid labeled full upper lid recedes posteriorly under the superior orbital rim. This not only gives a sunken appearance, but also significant brow ptosis (see Fig. 10-4).

FIG. 10-9, cont'd



HOW LEVATOR DEHISCENCE CAN CAUSE SUNKEN UPPER LID

The primary pathology in this condition is dehiscence or extreme thinning of the levator aponeurosis, permitting the lid margin to droop and partially cover the pupil (see labeled box 1 above, and follow the sequence around the illustration). A clinical example of this is shown in Fig. 10-7.

When the sunken lid is caused by levator dehiscence the aponeurosis of the levator is extremely thinned as it attaches to the tarsal plate, allowing the lid margin to droop. The secondary insertion of the aponeurosis into the upper lid skin (which creates the upper tarsal fold) remains relatively intact. As the levator contracts ever more posteriorly in an attempt to raise the lid, the lid crease and its associated skin and periorbital fat are pulled progressively further back under the superior orbital rim, creating the same sunken appearance. Unless the plastic surgeon has extensive experience with levator repair, we recommend referring the patient to an oculoplastic surgeon for this repair, but not until 6 to 12 months after all aesthetic surgery has been completed, for two reasons:

1. In the best of hands, levator repair is an imprecise science and requires revision in at least 20% of cases. If the rest of the rejuvenation is nearly perfect and a levator repair is also performed, if the lid position is not perfect, the patient will be unhappy with the entire surgical effort.
2. If the levator repair is performed first, any subsequent aesthetic surgery on the upper lid runs the risk of upsetting the delicate balance that holds the lid in its corrected position.

Regardless of the cause, *the sunken upper lid leads to a seemingly paradoxical and unanticipated situation:* Although not visible, the retraction of the fat behind the superior orbital rim usually conceals a fairly large amount of redundant skin. It takes two to three times more skin to follow the fat back a centimeter into the orbital recess and then back out again, compared with the amount of skin needed to come straight down from the orbital rim to the lid crease. Therefore, *if the sunken upper periorbital fat is restored by fat grafting,* this excess skin will no longer be taken up by its journey into the orbit and will create a redundancy that needs to be excised.

TRADITIONAL MODALITIES FOR TREATING AGING CHANGES

The "Big Four" procedures of traditional aesthetic facial surgery include brow lift, blepharoplasty, face lift, and rhinoplasty.

Brow Lift

Having used the open coronal brow lift for more than 15 years, when I (T.L.R. III) recalled and studied a large number of my patients, I found that despite good clinical results, 35% of my *open coronal patients* stated that they "would never do it again" and 20% said "they would never recommend it to a friend." Reasons included anesthesia and paresthesias (especially itching); 23% were temporary and 19% were persistent, lasting up to 5 years. No endoscopic patients had persistent paresthesias.

In contrast, 97% of *endoscopic brow-lift patients* said they would do it again, and 93% would recommend it to a friend; 11% of coronal brow-lift patients complained of hair loss and scar visibility, compared with only 3% of endoscopic patients. Thus we abandoned coronal brow lift in favor of the endoscopic approach. We use five ports: a midline, a pair of paramedian, and a pair of temporal incisions, each about 1.6 cm long and extending radially back from the hairline. The paramedian incision is located directly above the area where maximal elevation of the brow is desired—usually laterally. Dissection is subperiosteal and corrugator muscle resection is done in all cases, meticulously avoiding every fiber of the supratrochlear, supraorbital, and the lateralmost branch of the supraorbital nerves. Unless a significant transverse crease of the nasal radix requires it, we do not routinely resect the procerus muscle. This eliminates bleeding from the multiple vertical veins that run through the procerus, but even more important, it permits leaving intact a 1.5 cm wide strip of periosteum in the midline, which helps anchor the medial brows down and avoids their overelevation. We use two Endotine (Coapt Systems, Inc., Palo Alto, CA) 3.0 mm absorbable fixation devices inserted through the paramedian incisions.

In our last 100 cases of endoscopic brow lift there were no infections or hematomas, no persistent paresthesias, and no permanent hair loss or concerns about scars. In about 5% of patients the skin over the Endotine device became sensitive to touch because of the sharp points and lasted up to 6 months, when the tines dissolve. I have learned since then that one can inject lidocaine with epinephrine into a sensitive area caused by the device after 4 to 6 months, then gently massage it to break the tines off the base and relieve these symptoms.

Face Lift

We choose the face-lift technique based on the amount of loose skin in the neck. If skin redundancy is moderate, and responds well to manual elevation with a vertical vector, we use the MACS-lift. Moderate platysmal banding is not a contraindication. In these cases, a simultaneous anterior platysma repair is performed with transection of about 50% of the width of the muscle, below the angle of the neck. No drains are used, all wounds are sprayed with Hemoseel tissue adherent, and pressure is maintained for 3 minutes. We do not use the third suture loop of the extended MACS-lift for several reasons. First, frequently there is inadequate midcheek soft tissue to gain the desired malar enhancement. Second, the mean age of my facial patients is 59, and at this age, the third suture bunches up the lateral lower lid skin so much that a skin excision is required, usually 2 to 3 cm long and extending several millimeters beyond the lateral canthus. A skin incision is otherwise not necessary, because we use the transconjunctival approach for lower blepharoplasty. This saves the patient an unnecessary scar and saves the surgeon several minutes per eye for cut-

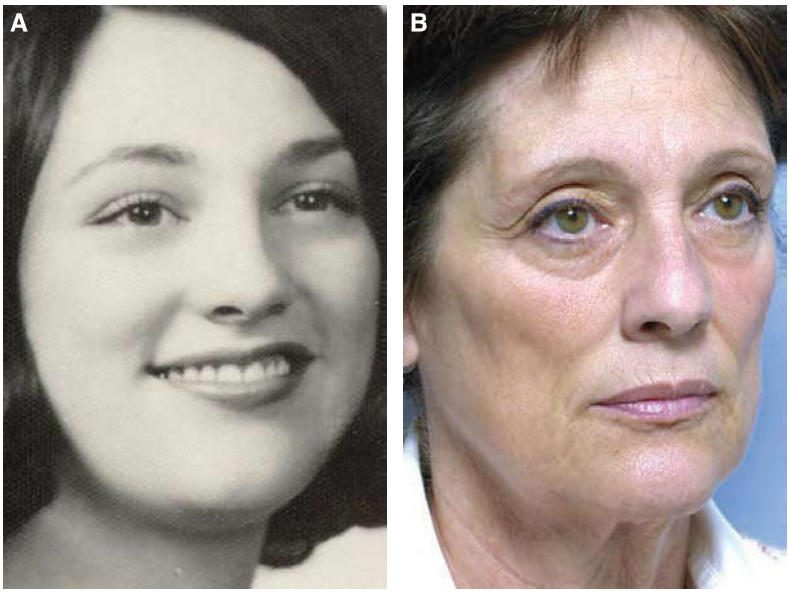
ting, hemostasis, and suturing. Total time for the lower transconjunctival blepharoplasty with the CO_2 laser is 3 to 4 minutes per eye (or zero if no blepharoplasty is necessary). Third, because all tissue under tension undergoes the biomechanical process known as *creep* (relaxation along lines of maximal tension), we suspect (but have no academic proof) that the malar area augmented by microfat grafting will stay in place far longer than tissue brought up by the third suture loop. Further, if the elevated tissue is inadequate, autologous fat grafting or an implant will still be required. Lastly, any loose periorbital skin is routinely tightened with laser resurfacing, so again, no lower lid skin excision is required.

Upper Blepharoplasty

Because the lid crease in the youthful lid is 8 to 10 mm from the lid margin, the lower limb of the upper blepharoplasty incision should be 8 to 10 mm from the lid margin (in men and women).

Fat and Muscle Resection

FIG. 10-10



Rarely does a full-blown paradigm shift occur for experienced surgeons, but such a pleasure was offered by Fagien when he perceived that the attractive, youthful upper eyelid does not have less fat than the gaunt or baggy older eyelid. In fact, the upper lid and infrabrow areas are quite full, but their skin is taut and elastic.

FIG. 10-11

Admittedly, the ptotic brow can bring excess infrabrow skin and soft tissue into the upper eyelid area. But when this is repositioned manually or surgically, there is rarely excess fat in the upper lid (except the medial pad); it is just too loose. This paradigm shift led Fagien to suggest rarely or never removing fat from the central or lateral upper lid, but rather to tuck it into a tighter wrapper by removing skin only, similar to what is done in a traditional mastopexy. We have been doing this since it was suggested, and we totally agree. Upper lid fat has been overresected for decades, leaving eyes too hollow, especially as the aging process occurs.

FIG. 10-12

The goal should be to restore, to the extent possible, the full but firm appearance of youth. Except for the medial pad, fat is rarely removed unless extremely redundant. This is especially true in men, in whom excess soft tissue removal can feminize the eyelid. Otherwise, only skin is resected (no orbicularis oculi muscle).

Closure

Unless a lateral canthal tendon suspension (described later in this chapter) is to be performed for a lax lid margin, the skin is closed at this point, using a 6-0 Prolene running subcuticular suture. This is generally left in for 5 to 7 days, but can be left as long as necessary without the crosshatching of interrupted or running sutures.

Lower Blepharoplasty

We prefer transconjunctival lower blepharoplasty. This technique avoids a scar, provides excellent exposure, and saves several minutes of operating time per eyelid.

Cutting is done with the CO_2 laser-focused handpiece, using 8 watts in the continuous wave mode, which is quick and almost bloodless: Small vessels smaller than 1 mm in diameter can be coagulated by raising one's hand to defocus the beam, creating heat. An electrocautery unit is always at hand in case a larger vessel or bleeding artery is encountered.

Henry Baylis, professor of ophthalmology at UCLA, proved long ago that a transconjunctival incision does not need to be closed. In fact, there is a higher granuloma rate when it is closed.

Rhinoplasty

A discussion of rhinoplasty technique is beyond the scope of this chapter. We would consider combining rhinoplasty with any facial procedures except face lift (this combination makes for a potentially long operative time).

SYNERGISTIC PROCEDURES: THE FIVE COMPLEMENTARY PROCEDURES

Philosophy

The "Big Four" traditional facial aesthetic procedures—face lift, brow lift, blepharoplasty, and sometimes rhinoplasty—are the mainstays of facial aesthetic surgery. However, even together they do not begin to address all the changes of the aging faces shown in Figs. 10-4 and 10-5. Fully two thirds of these signs of aging *(labeled in red)* cannot be treated by these four traditional procedures. Because our patients expect the very best, most natural results possible from us, we as aesthetic plastic surgeons must develop the tools, skills, and judgment to deliver "the rest of the package."

Clearly, the best today is often far better than our best of 20 years ago. If we are to maintain our leadership role in aesthetic plastic surgery, we must be open to new concepts and new techniques, but not necessarily ready to jump into every new idea. As the old adage says, "Be not the first to take up the new, or the last to leave the old behind." We need not all be pioneers. Pioneering comes at a price—new and unexpected risks for our patients (such as the profound hypopigmentation of aggressive laser resurfacing, which did not become apparent to me (T.L.R. III) until 12 months after I had become impressed by the rather remarkable improvement in skin wrinkles I could obtain with the laser). We do not all need to be pioneers, but we do need to look critically at each new concept and seek the opinions of those we trust who have more experience in the particular area.

Furthermore, it is wise to remember that virtually every new technique goes through three phases:

1. The *zealot phase:* The pioneers ardently promote a new technique for a wide variety of patients.
2. The *reactionary phase:* The broader application by newly taught disciples brings complications and long-term problems to light, and those who held off say, "I told you so."
3. The *mature phase:* The appropriate application and limits of the technique are understood.

We now have in our armamentarium many techniques that have been introduced in the past 10 or more years and are in this mature phase. These procedures have much to offer the appropriate patient, often at less risk than the traditional ones, yet some have not been incorporated into our practice or have been incorporated only minimally.

Perhaps one of the greatest enemies of obtaining the best for our patients is our natural instinct to find one method (for example, for face lift or eyelid rejuvenation) and stick with it. This gives us a comfort zone and is commendable because it tends to give predictable results. But one needs to look no further than rhinoplasty to see that this static, singular, one-size-fits-all approach will often give only mediocre results.

In the rest of this chapter we present five complementary techniques that meet these criteria and are in the mature phase of their application. An attempt is made to show that their combination with the traditional procedures can yield an outcome that is greater than the sum of its parts. These synergistic procedures can often have a far greater effect on the result than the combined effect of the traditional ones.

Complementary Procedure 1: Microfat Grafting

Technique

Our technique for microfat grafting is similar to that of Coleman; it emphasizes meticulous harvesting, preparation, and careful drop-by-drop grafting to ensure the greatest survival and predictability of outcomes.

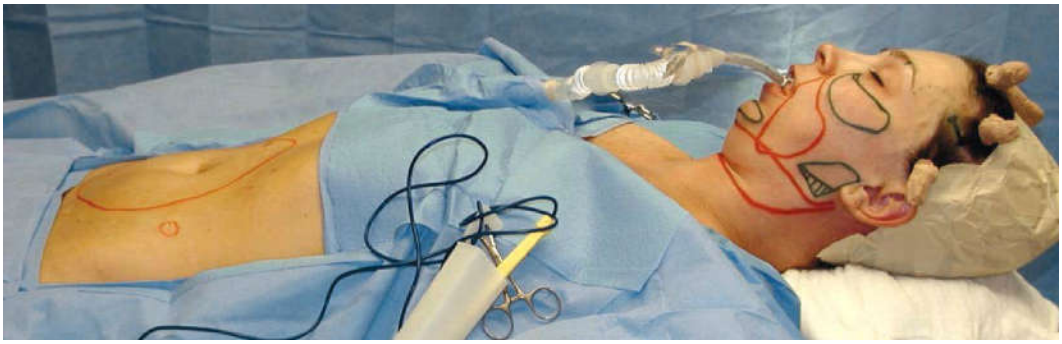
Marking the Patient

FIG. 10-13

The patient is placed in a sitting position (before any sedation) with the surgical spotlight directly overhead. Tangential light and its resulting shadows enhance one's ability to perceive the most subtle nuances of facial topography. Even in this small photograph, the tear trough, malar facial fold, nasolabial folds, marionette lines, and lateral chin notches can be seen.

Surgical Setup and Instruments

FIG. 10-14

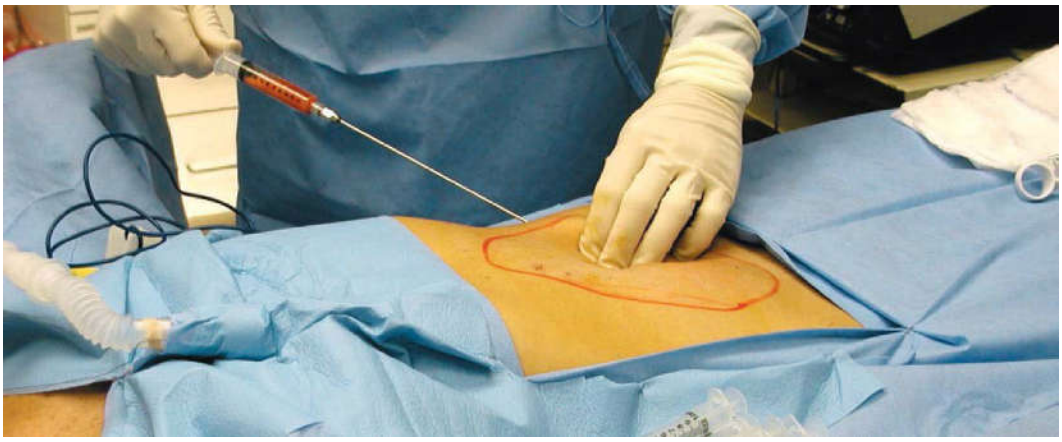


Setup for microfat grafting

On all of our photos and diagrams, *green marks* are used to signify an area for grafting, *red* for liposuction, and *black* outlines an area for laser resurfacing.

The fat donor area (usually the abdomen or inner thighs for ease of access) and the head are prepared and draped simultaneously. Lidocaine (Xylocaine) 0.5% with epinephrine is injected into the donor site to promote hemostasis. General anesthesia is used for major cases or multiple recipient sites; local anesthesia with sedation could be used equally well.

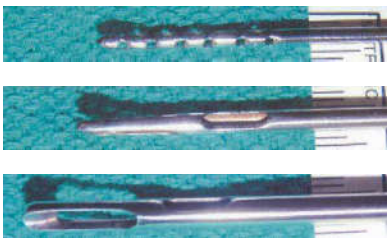
FIG. 10-15



Harvesting technique

The fat is harvested manually with a 10 cc syringe and only 2 to 3 cc of vacuum, because high vacuum can disrupt the fat cells.

FIG. 10-16

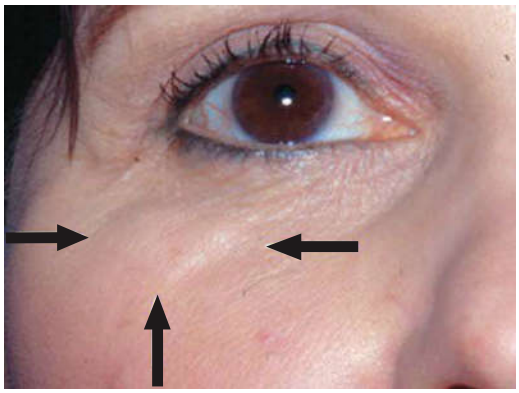


Region	Cannula Inside Diameter	Tip Style	Hole Diameter	Size of Fat Particle
Tear trough/ eyelid	1.7 mm	Becker rasp "cheese grater"	1 mm	0.2 mm^3
Face	2.7 mm	Keel	2 mm	4-8 mm^3
Body	3.5 mm	Keel	3.5 mm*	22 mm^3

*Largest size compatible with Luer-Lok device.

Harvesting cannulas are shown above. The middle one labeled "face" harvests particles 2 mm in diameter. We use the efficient keel-tip contour cannula, which harvests very fine particles.

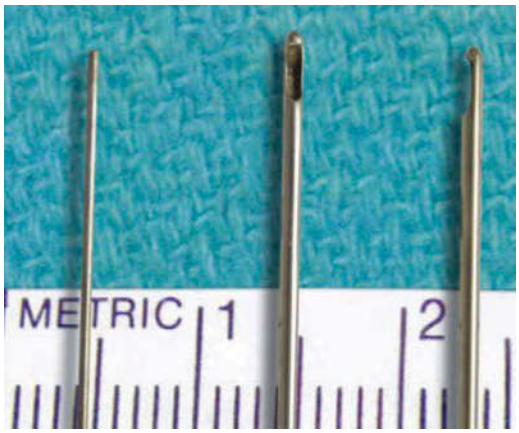
FIG. 10-17



Lumpiness of eyelid after grafting with standard 2 mm particles

If fat harvested with the usual 2.7 mm cannula (2 mm diameter particle) is grafted in the periorbital area, where the skin is only 0.2 to 0.5 mm thickness, the fat will survive very well, and after all edema is resolved in about 12 months, the lumpiness of the fat globules will be clearly visible through the skin *(arrows)*. This is very frustrating to the patient and surgeon and requires a new incision (sometimes multiple incisions) over each globule to tediously sculpt down each bulge. We searched for a better solution and found the cannula designed by Becker (see Fig. 10-16; Wells Johnson Co., Tucson, AZ), which has multiple holes sharpened and angulated like a cheese grater. This design produces a particle about 0.2 mm^3, only about 5% of the volume of the standard cannula (4 to 8 mm^3).

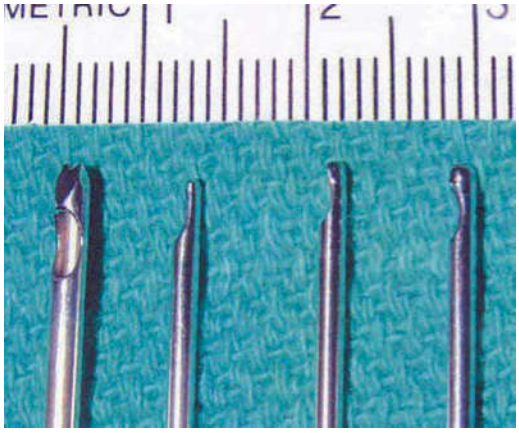
FIG. 10-18



Trepsat fine-particle grafting cannulas

To graft these fine particles, we use a blunt 19-gauge cannula designed by Trepsat (No. PLA160T3; Pouret Medical, Clichy, France). We have never seen any lumpiness since we changed to these special harvesting and grafting cannulas. However, one should *not* overcorrect: a very high percentage of these fine particles will survive in the eyelid, so the surgeon should be conservative.

FIG. 10-19



Grafting cannulas (Coleman)

To graft the rest of the face (other than the periorbital area), Coleman's regular cannulas are used.

Fat Preparation

The fat is centrifuged sterilely at 2000 rpm for 2 minutes. The oil is decanted, and the aqueous layer is drained off the bottom. The fat is then loaded through a closed system, without washing, into 1 cc syringes.

Microfat Grafting as a Permanent Biocompatible Filler

The simplest and earliest application for autologous fat grafting was the filling of defects—facial and elsewhere. This puts the least demand on the grafted fat, because it does not have to maintain a shape (as required for augmentation of the cheeks or chin); it just needs to maintain its volume. There is one difficult aspect of this application, however: Often whatever created the defect or depression includes significant physical or inflammatory trauma, resulting in scarring and decreased blood supply.

FIG. 10-20

Aesthetic Problems	Surgical Plan
Multiple deep facial depressions from acne scarring, made worse by: Facial laxity	Microfat grafting to acne depressions MACS-lift In general, no laser resurfacing on cheeks for men (hypopigmentation)

This 43-year-old man had severe cystic acne as a teenager and was left with multiple deep, irregular depressions on his face. These became even more noticeable as he aged and his facial skin became looser. With a clear understanding of the limitations, he underwent microfat grafting to these areas, along with a MACS-lift. In these cases, after preliminary grafting, it is virtually always necessary to release any chords of scar tissue that bind the skin to the underlying tissue. This is done with the V-dissector (pickle fork) shown on the left in Fig. 10-19. Finally, a layer of fat is laid in this tunnel to prevent the readherence of the skin to its bed.

FIG. 10-20, cont'd

The result is shown at 1 year. The procedure made a dramatic difference in his self-esteem, and he was extraordinarily appreciative of our efforts. Such deep and scarred defects often require a second stage, but that was not necessary for this patient.

Structural Microfat Grafting for Augmenting Specific Facial Areas

Building facial structure. One of the amazing things that Coleman proved is that fat grafting could be used not only as a filler, but also as a tissue for augmenting and actually changing facial structures. He called this technique *structural fat grafting*.

Quantity of fat needed. There is a significant, somewhat predictable resorption of the fat, which varies from area to area. The percent reabsorbed is roughly in proportion to the amount of movement in the area, with greatest reabsorption in the lips, and least in the malar area. An approximate estimate of the amount of fat needed is shown in Table 10-1.

Special considerations for grafting each facial area

FOREHEAD AND FROWN LINES. Forehead and frown lines are densely tethered to the underlying muscle. We graft immediately under the lines to distend and fill them as much as possible. (CAUTION: Use very low pressure and only a blunt cannula for grafting here. The veins around the orbit have no valves, and

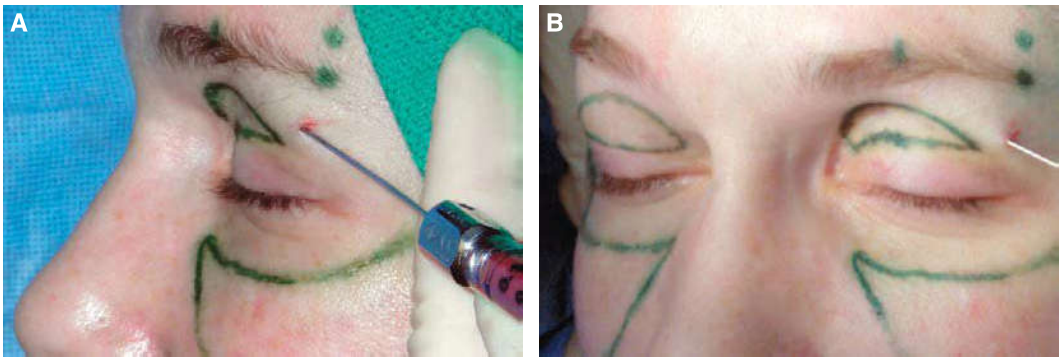
Table 10-1 Volume of Fat Grafted and Degree of Resorption for Each Facial Area

Facial Area	Degree of Fat Resorption	Typical Volume of Fat Grafting
Glabellar furrows	Moderate if corrugator is resected High if corrugator not resected	1-2 cc
Upper lid hollow	Moderate/high	2-4 cc/side
Tear trough/malar facial groove	Moderate	1-2 cc/side
Malar	Low	10-15 cc/side
Sunken midcheek	Moderate/high	6-16 cc/side
Nasolabial fold	High	5-8 cc/side
Lips	High	Upper 4-6 cc; lower 8-12 cc
Angle of jaw	High	15-25 cc/side
Chin	High	12-20 cc
Lateral chin notch	High	3-4 cc/side
Temples (intramuscular)	Moderate	6-12 cc/side
Entire vertical height of upper lip for anterior maxillary hypoplasia	High	12-20 cc

embolization to the retina is possible.) A V-shaped dissector is then used to release the band of attachment to the underlying muscle, and finally a small amount of fat is laid in this tunnel to minimize reattachment of the skin crease to the muscle. NOTE: Unless a brow lift with deactivation of the corrugator muscle is also performed, there is a much greater chance for recurrence of these lines.

INFRABROW/UPPER LID. Grafting the infrabrow/upper lid was the insight and genius not only of Coleman, but also of Lambros. We had been removing fat from the upper lid for decades, so *adding volume* by grafting this area was a concept that took a long time for acceptance. But Lambros's serial photographs of the aging periorbital area are convincing and should be studied. The reader should review Figs. 10-1 and 10-6 and refer to the earlier discussion of the sunken upper lid. Before grafting, one should review in detail the anatomy of the upper orbit as it is carefully described and illustrated by Zide and Jelks.

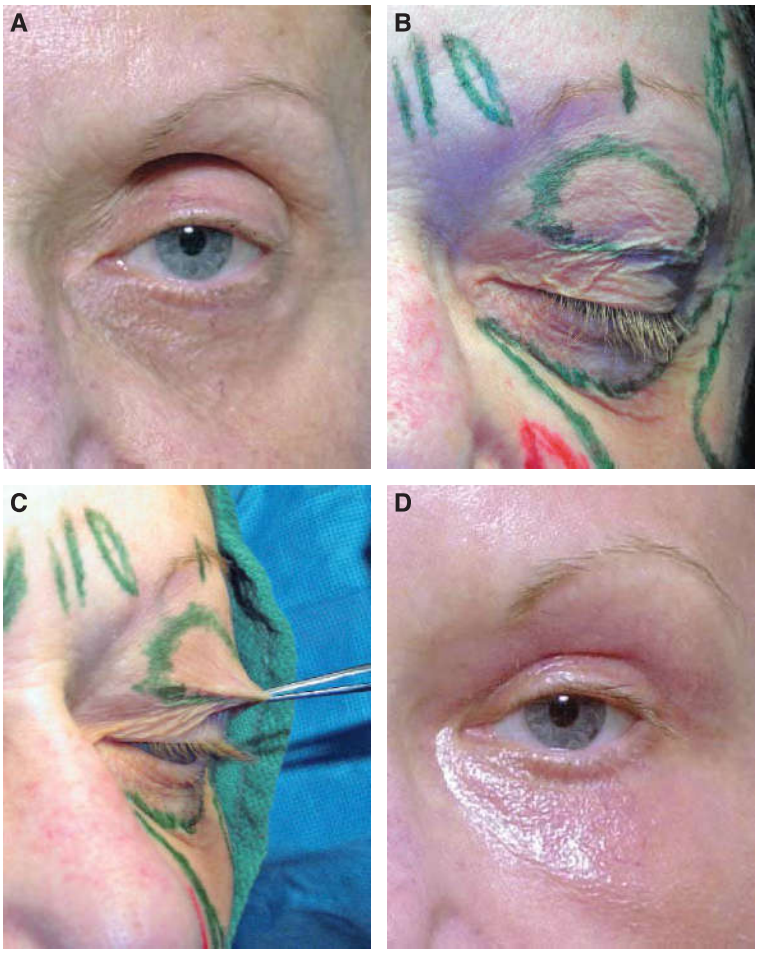
FIG. 10-21



Microfat grafting to the infrabrow region is performed with the 19-gauge Trepsat cannula. The incision is tiny and placed for best access to the superior orbital rim. Note the angle of the cannula shown in two planes in Fig. 10-21, *A*. The surgeon must exercise caution to avoid injury to the globe when feathering the graft down into the upper lid. In Fig. 10-21, *B,* grafting has been completed on the patient's right lid and the result is a smooth transition from the brow to the upper lid in this 37-year-old patient.

Any grafting in this area must be done with a blunt-tip cannula and under low pressure (because the periorbital veins have no valves, embolization is a possibility). For grafting the areas with extremely thin skin (the eyelids and tear trough), we use only a special 19-gauge blunt-tip cannula with a side hole developed by Frank Trepsat (see Fig. 10-18). In the periorbital area, we use only the fine particulate fat harvested with the Becker cannula (see Fig. 10-16, *top*). Literally only about 0.01 cc of fat is deposited per pass, and that is done only during the *withdrawal* phase of each pass. All of these precautions are taken to minimize not only the risk of embolization, but also to decrease the chance of a large deposit suddenly being injected under the thin eyelid skin where it may be visible as a lump. The fat should be used to *build down* the superior orbital rim, *not* to inject blindly into the recess over the globe. The surgeon should be conservative in the amount grafted (start with 1 to 2 cc per side) until long-term experience has been gained. It is much easier to add more later than to try to remove an excess amount. The percent survival here is variable, and the surgeon may be surprised if too much remains.

FIG. 10-22



This 63-year-old woman has sunken upper lids and infrabrow area. Immediately after microfat grafting to this area, with about a threefold overcorrection, the amount of loose skin that was concealed in the orbit is evident, as demonstrated with forceps in Fig. 10-22, *C.* Skin resurfacing with the Sciton laser (two passes at 80 microns of ablation, 50 microns of coagulation, and 50% overlap) served to heat-shrink (or tighten) and smooth the periorbital skin; only a minimal excision of upper lid skin was necessary. The early result at 20 days is shown in Fig. 10-22, *D;* compare this result with the preoperative view in Fig. 10-22, *A.*

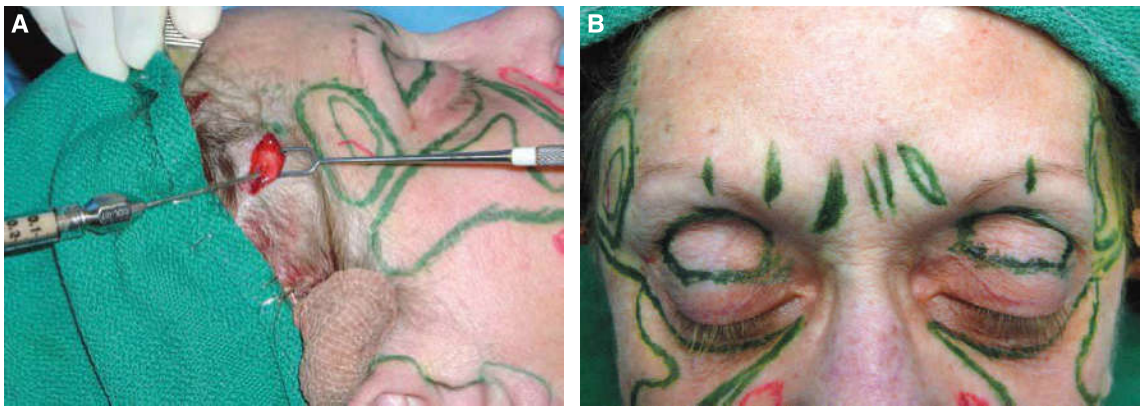
MICROFAT GRAFTING TO THE TEMPLES. A very common component of the gaunting pattern of aging is the appearance of a sunken temple area (the area superficial to the temporalis muscle, between the zygomatic arch and the temporal crest of the skull). This atrophy of the temple area can be seen in comparing Figs. 10-1, *A,* and 10-1, *B.* The temporal crest line is clearly visible in Fig. 10-1, *B,* but is rarely seen in young women of normal weight.

Correcting the hollow temple is best done by microfat grafting into the substance of the temporalis muscle (rather than in the subcutaneous plane) for three reasons:

1. The subcutaneous plane is often very thin in these patients, and could not hold enough fat to correct the defect.
2. The deep surface of the subcutaneous plane (above and below the superficial temporal fascia) is a loose areolar zone. Fat injected subcutaneously will easily dissect into this loose plane, resulting in a poorly vascularized pancake of fat, which will likely be reabsorbed.
3. The subcutaneous temporal plane contains the superficial temporal artery and several large veins; using this plane would thus also increase the risk of significant ecchymosis.

It is best to make a small incision down to the deep temporal fascia. Fig. 10-23, *A,* shows the use of the temporal incision of the endobrow lift for access. A much smaller incision can be used if an endobrow lift is not being done. The deep temporal fascia is opened with a No. 11 blade, and the Coleman III-7 cannula is used. In Fig. 10-23, *B,* the right temple has been grafted and the left is still hollow. Because this grafting is completely intramuscular, we would anticipate a much higher survival rate and would recommend only overcorrecting by 25% to 30%.

FIG. 10-23



TEAR TROUGH AND MALAR FACIAL GROOVE. Only the fine-particulate fat should be used. One must remember that the orbicularis oculi muscle is here, and there may be an unusually high survival rate, so a novice should start with 0.5 cc until more experience is gained. We rarely use more than 1 cc; we tell the patient that we would rather come back a second time than overshoot. The fat is grafted in all layers from the bone up to the skin, but only 0.01 cc per pass. The grafting is feathered up from the tear trough to within about 5 mm of the lid margin. This method makes it possible to completely obscure the lid-cheek junction, providing a much more youthful eyelid appearance (see Fig. 10-6). A hypoplastic inferior orbital rim can also be built up to markedly improve the appearance of this area (see Figs. 10-43 and 10-53).

MALAR AREA. A well-proportioned cheek bone can add stunning beauty to a woman's face (Fig. 10-24) and attractiveness to a man's face (Fig. 10-25). For this reason, it is worth studying the three-dimensional anatomy of a beautiful cheek. It is not simply the malar eminence; in its fullest expression, the female cheek extends in one continuous curve all the way down to within 1.5 cm of the corner of the mouth. Its axis then rises *obliquely* up to the sideburn. Its extension over the zygomatic arch is not horizontal, as we might suppose; rather, it too rises *obliquely upward* as it moves posteriorly. The margins of the cheek should generally be soft for a woman (unless a strong, athletic look is desired). For a man, the cheek bone should have a similar orientation, but have more chiseled-looking margins (Fig. 10-25, *B*) and not be as full or extend as far inferiorly as a woman's. These details are not intuitive and require some study.

To harvest fat to be grafted into the malar area and down, where the skin is thicker than the periorbital area, the regular harvesting cannulas of Coleman or the 2.7 mm ID with the keel-shaped tip shown in the middle of Fig. 10-16 are used. This harvests particles about 2 mm in diameter, which is ideal for the rest of the thick-skinned area of the face. Fat is grafted only during the withdrawal phase of each pass (to minimize the risk of embolization). Only 1 cc syringes are used to minimize the injection pressure needed. This precaution also minimizes the risk of embolization and the possibility that a blockage giving way suddenly could result in a large bolus of fat being deposited in one area. No more than 0.1 cc is deposited along the 2 to 4 cm path of the cannula on each pass. This technique ensures that the fat will be deposited in tiny droplets, and that each cluster of fat cells will be surrounded by the blood supply of normal tissue. To inject a deposit even as small as 1 cc would create a lake of nonviable tissue; only the periphery in contact with surrounding tissue will survive; greater than 95% will be reabsorbed.

FIG. 10-24

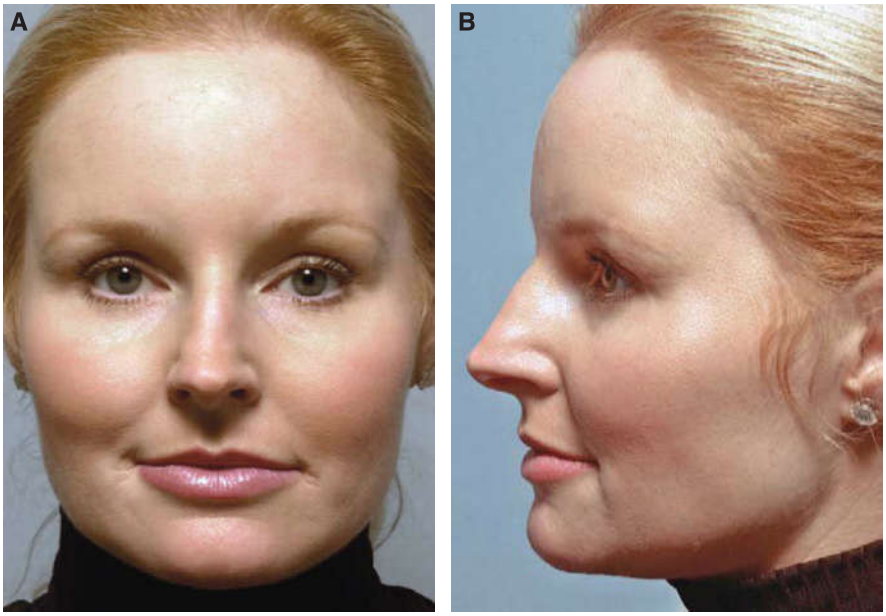


FIG. 10-25

FIG. 10-26

Augmentation of the malar area is frequently done at the same time as a face lift. Grafting is always completed before the face lift is begun. It is natural to wonder how the fat could remain in position once the face-lift flap is elevated, and how it could survive (Fig. 10-26).

In Fig. 10-26, microfat grafting to the malar area is completed, including about 30% to 50% overcorrection, before the face lift is begun. For grafting the malar area, two incisions, each 2 mm, are used, one in the sideburn and one on the malar eminence. The cheek looks appropriately exaggerated at this point.

The same patient is shown after the dissection for a MACS face-lift has been completed. By comparing Fig. 10-26, *B,* with Fig. 10-26, *C,* where a blue tape has been placed around the grafted zygomatic arch and malar area, one can see that the mound created by the grafting remains undisturbed.

The reason for its stability (and its survival) can be discerned from Fig. 10-26, *C.* Each cluster of fat cells is firmly embedded in and immobilized by the fibrofatty tissue over the zygomatic arch and malar eminence. The fat cannot be rubbed away mechanically, nor will it be displaced by pressure on the mound. An analogous situation would be to place multiple tiny pieces of tissue paper into gelatin before it sets up, then after gelling occurs, trying to squeeze out or extract the pieces of tissue. It cannot be dislodged, no matter how hard one tries.

We prefer to augment the malar area rather than elevate the malar fat now residing in the midcheek area. The reasons for this follow:

1. Once mastered, microfat grafting is simpler and quicker (about 3 to 5 minutes total for both sides).
2. With grafting, the surgeon has complete control over the degree of augmentation and the contour desired, including where the high point should be and whether to continue the augmentation along the zygomatic arch. This degree of complete choice and control over contour is not possible with cheek implants, which is a longer procedure with problems that include displacement and visibility of the margins.
3. Most techniques also elevate the skin into the lower eyelids, causing bunching and requiring skin excision under the eyes; grafting avoids this problem.
4. Some techniques, such as the *transblepharoplasty cheek lift,* carry a significant risk of ectropion or other distortion of the eyelid margin when the lift relaxes and the soft tissue begins to descend.
5. The meticulously repositioned fat that is sutured in place in Little's technique, creating beautifully sculpted cheeks, will probably remain longer than tissue that is simply lifted, but the trade-off is a few extra hours of surgical time (compared with 3 to 5 minutes for microfat grafting to the cheeks). Surgeons can aspire to create the beautiful *ogee curve* that Little first brought to our attention.

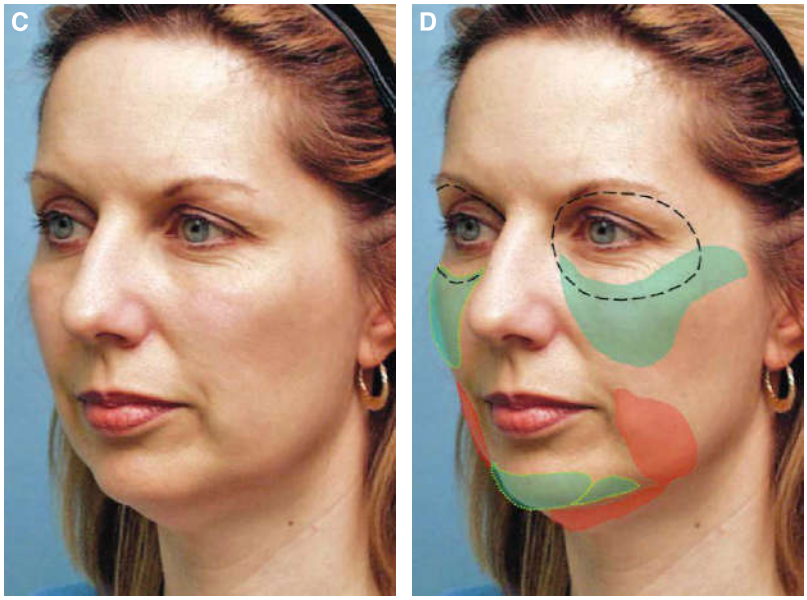
AUGMENTATION OF THE CHIN BY MICROFAT GRAFTING. Plastic surgeons have long been aware of the increase in youthfulness and attractiveness that can be achieved by adding a chin augmentation to a face lift when a patient has some degree of microgenia. Similarly, in some rhinoplasty patients, a weak chin makes the nose look even larger.

FIG. 10-27

Both of these effects are demonstrated by comparing the preoperative and postoperative views of this patient. The restoration of near-ideal facial proportions, in combination with the rhinoplasty, a MACS-lift, and minor liposuction of the jowls and neck, clearly have a dramatic *synergistic* effect: she looks not only younger, but more elegant and more attractive. The chin augmentation not only restores harmony with the nose, but gives *a longer, sleeker look to the jawline*. Anything that interrupts the smooth, crisp line of the jaw takes away from this effect, as will be shown in the next two sections.

AUGMENTATION OF THE LATERAL CHIN NOTCH. The triangular shadow (just lateral to the chin in Fig. 10-27, *A*), which suggests notching of the mandibular margin, is a common sign of aging. Although this notch is not a major problem, it has three negative effects on attractiveness: (1) detraction from the crispness of the jawline, (2) tendency to make the chin look pointy and narrow, and (3) tendency to exaggerate the fullness of the jowl.

FIG. 10-27, cont'd



Aesthetic Problems	Surgical Plan
Periorbital wrinkles	Endobrow lift, periorbital laser resurfacing, and malar augmentation
Tear trough	Microfat grafting to tear trough
Deep nasolabial folds, depressions around mouth, and notches of mandibular margin at lateral chin	Microfat grafting to mandibular notch at lateral chin
Slight nasal hump	Rhinoplasty
Weak chin	Chin augmentation by microfat grafting
Mild jowling and cervical laxity	Liposuction of jowl and neck
Facial laxity	MACS-lift

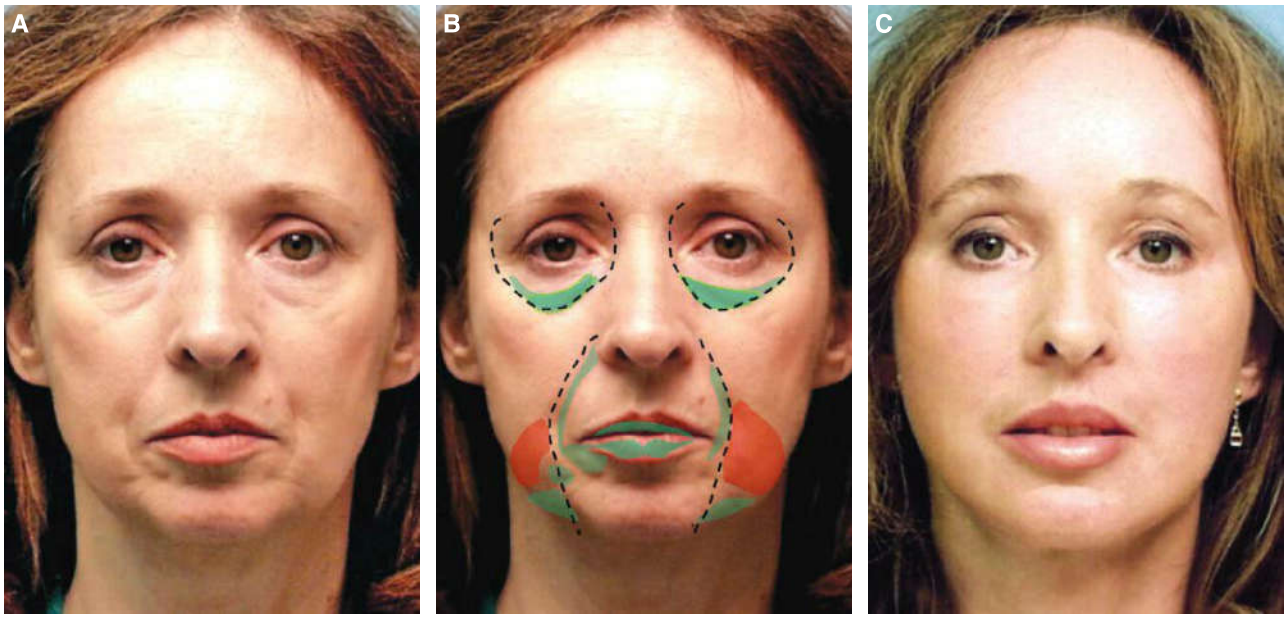
The benefit of microfat grafting is subtle, but visible on all views. The chin looks less pointy, there is no residual hint of a jowl, and the jawline is long, smooth, and clearly defined from the neck. Fig. 10-27, *D*, shows the patient's full surgical plan.

On this and all subsequent cases, green represents areas to be grafted, red indicates areas to undergo liposuction, and black outlines are the areas for laser resurfacing.

FIG. 10-27, cont'd

The crispness of the jawline in Fig. 10-27, *F* (created by microfat grafting to the chin and lateral chin notch) is further enhanced by liposuction of the jowl and neck and a MACS-lift. The final three elements of her facial enhancement were malar augmentation, periorbital laser resurfacing to improve the wrinkles around her eyes, and an endobrow lift. These three procedures alone gave complete rejuvenation of the periorbital area; no blepharoplasty was necessary.

FIG. 10-28



Aesthetic Problems	Surgical Plan
Drooping lateral brows give a "sad" or depressed look	Endobrow lift
Tear trough Deep nasolabial folds, depressions around mouth	Microfat grafting to tear trough, nasolabial folds, and depressions around mouth
Notches of mandibular margin at lateral chin	Microfat grafting to lateral chin notches
Thin, "pruney" lips	Lip augmentation by microfat grafting
Mild jowling	Minor liposuction of jowls
Facial laxity	MACS-lift
Wrinkles of eyes and mouth	Periorbital and perioral laser resurfacing

The three negative effects of the lateral chin notch (loss of a smooth, crisp jawline, a tendency for the chin to look pointy and narrow, and the exaggeration of the jowl) can be seen bilaterally in the patient in Fig. 10-28, *A*. Correcting these effects by microfat grafting in the areas shown in green in Fig. 10-28, *B,* is an easy, quick procedure that can reverse these three problems and is well worth inclusion in our armamentarium. The rest of the planned procedures are listed below. In Fig. 10-28, *C,* she is seen 1 year postoperatively.

The procedures that had the greatest effect on rejuvenation in this patient were probably not the traditional procedures (face lift and brow lift); rather, the dramatic effects around her mouth and eyes resulted from microfat grafting and laser resurfacing. At age 52, after the death of her husband 2 years earlier, she was ready to get a fresh start on life.

AUGMENTATION OF THE ANGLE OF THE JAW. When the angle of the jaw is poorly defined or too oblique, augmentation of this area (gonioplasty) can have a positive effect on facial attractiveness. A crisp, well-defined angle of the jaw, situated about 1 to 1.5 inches below the ear lobe and forming about a 120-degree angle (Lindauer, personal communication, 2007), is a feature common to many attractive women (see Fig. 10-24, *B*), and to most supermodels, and thus is a part of the definition of facial beauty in both North America and Europe.

FIG. 10-29

By contrast, this patient has a jaw angle (the gonial angle) that is more obtuse, creating a high mandibular plane angle. Instead of meeting the ascending ramus at a little greater than a right angle, the mandibular margin rises obliquely toward the earlobe.

This high mandibular plane angle is often associated with two other features that detract from the appearance of the jawline: (1) a weak chin (microgenia or micrognathia), and (2) a true bony notch in the posterior one third of the margin of the mandible (the antegonial notch). This patient demonstrates both of these features. In addition, she has the previously described notch of the mandibular margin at the lateral chin. Thus she has almost all possible factors that can detract from the appearance of the jawline. (The only other common factor, which this patient does not have, is a thick submental fatty deposit. This feature can make the jawline indistinguishable from the neck.)

The reason for the frequent association of microgenia with an obtuse angle of the jaw and a high mandibular plane angle is that the more open, obtuse angle of the jaw causes the chin to rotate downward and posteriorly, resulting in less projection of the chin (that is, microgenia or micrognathia). It is important to know that this mechanism can result in several possible dentofacial problems. Because the mandible is short relative to the maxilla, class II malocclusion is common (retrognathic: lower teeth too far behind the upper teeth), and may require orthodontics and/or orthognathic surgery to correct the underlying skeletal deformity. The obtuse jaw angle can cause the posterior teeth to come in contact before the anterior teeth, resulting in open-bite deformity, which will require orthodontics and possible orthognathic surgery to correct. Excessive vertical maxillary growth (vertical maxillary excess) can cause the mandible to rotate downward and posteriorly, resulting in a long-face syndrome and a weak chin.

Because of all these potential dentofacial anomalies that may be associated with a weak or obtuse angle of the jaw and high mandibular plane angle, *if there is any malocclusion, one should consider obtaining an orthodontic/orthognathic consult before undertaking correction of these problems by microfat grafting and/or liposuction*. If this surgery were done first, and then the patient later wanted to correct the class II malocclusion, removal of two maxillary teeth and orthodontics to obtain dental alignment might be required, which might lead to some anterior maxillary deficiency.

FIG. 10-29, cont'd

In this patient no significant orthodontic or orthognathic deformity was present, and the plan illustrated above was carried out. *Green* represents areas to be grafted, *red* indicates areas to undergo liposuction, and *black outlines* are areas for laser resurfacing. The *dark green* (tear trough and/or malar-facial groove) is a subsection of the larger malar area that requires specific and different technique from the malar region.

Her results, shown in Fig. 10-29, *E* and *G,* 15 months after her surgery, demonstrate that a substantial augmentation of the angle of the jaw has been achieved, along with a smooth, crisp mandibular margin. The antegonial and lateral chin notches in the mandible have been completely obscured. The angle of the jaw is no longer missing; it is now a crisp angle of about 125 degrees, situated about an inch below the earlobe.

Most dramatic, however, is the tremendous synergy of simultaneous augmentation of the chin and the angle of the jaw. The resultant smooth, crisp, distinctive jawline conveys not only attractiveness, but also a sense of youthful confidence or strength, whereas the common description of her preoperative appearance as having a weak chin and weak jawline is somehow subconsciously interpreted as indecisiveness and a lack of assertiveness.

Her final appearance was also enhanced by a MACS-lift, along with upper blepharoplasty with laser resurfacing of the periorbital area to decrease the wrinkles and the dark circles; malar and lip augmentation; microfat grafting to the tear trough, nasolabial folds, and labiomental sulcus; and liposuction of the medial cheeks, jowls, and neck.

Two stages were required, because fat grafting the angle of the jaw cannot be done at the same time as a face lift. Unlike the malar area, whose thick fat pad can be grafted at the same procedure as a face lift, the angle of the jaw has an extremely thin subcutaneous layer that is disrupted by a traditional face lift; and the MACS-lift puts too much tension on the masseter muscle for simultaneous fat grafts to survive. Certainly getting rid of her excess upper eyelid skin was important, but the greatest effect comes from her new high cheek bones and crisp jawline.

FIG. 10-29, cont'd

ANTERIOR MAXILLARY HYPOPLASIA. This patient of Dr. Patrick Tonnard (Fig. 10-30) requested correction not only of her nasal deformity, but also of her underprojecting upper jaw. She came in with her father, an orthodontist, who wanted aesthetic correction of the visible evidence of her anterior maxillary hypoplasia, but *without* any orthognathic surgery (he already had her teeth in perfect alignment). Tonnard's creative solution to this was to augment the entire vertical height of the upper lip by microfat grafting. This would typically require 10 to 15 cc of fat, compared with just 6 to 8 cc for augmentation of the vermilion portion of the lips.

NOTE: As is the case with recontouring the lower jaw with microfat grafting, it is crucial to check for dental malocclusion before correcting the deformity by microfat grafting. If the occlusion is not optimal, orthodontic consultation should be obtained. If this deformity is corrected by microfat grafting and a maxillary advancement is necessary later, the lip would then project too much and would be very difficult to correct, because the fat is integrated throughout all tissues.

Her postoperative result shows a significant transformation.

FIG. 10-30

MULTIPLE AREAS. Perhaps some of the most exciting applications of microfat grafting are at the convergence of bony facial deformity and aesthetic surgery. We have shown the use of microfat grafting for profound malar hypoplasia (see Fig. 10-25), for lower jaw deformity (see Fig. 10-29), and for maxillary hypoplasia (see Fig. 10-30). Cases illustrating these problems in greater detail will be presented later in the chapter (Figs. 10-42 and 10-43).

When multiple contour deformities are present, and these have historically been challenging to solve, microfat grafting can be especially valuable because it offers the *best solution* and is *minimally invasive*. The classic example of multiple contour deformities is Romberg's hemifacial atrophy. Fig. 10-31 shows a young woman with the classic story of this condition. Her facial features were normal through age 12, then gradually progressive sunken areas developed in the left side of her face, including the characteristic *coup de sabre* (saber cut) depression to the left of the chin midline. All tissues, including skin, subcutaneous tissue, muscle, and bone, are involved with the atrophy.

In the past, all sorts of heroic measures were attempted to treat this, including pedicled and microvascular flaps of skin, soft tissue, and omentum. All of these efforts were fraught with far more complexity, more problems, and less perfect results than microfat grafting.

FIG. 10-31

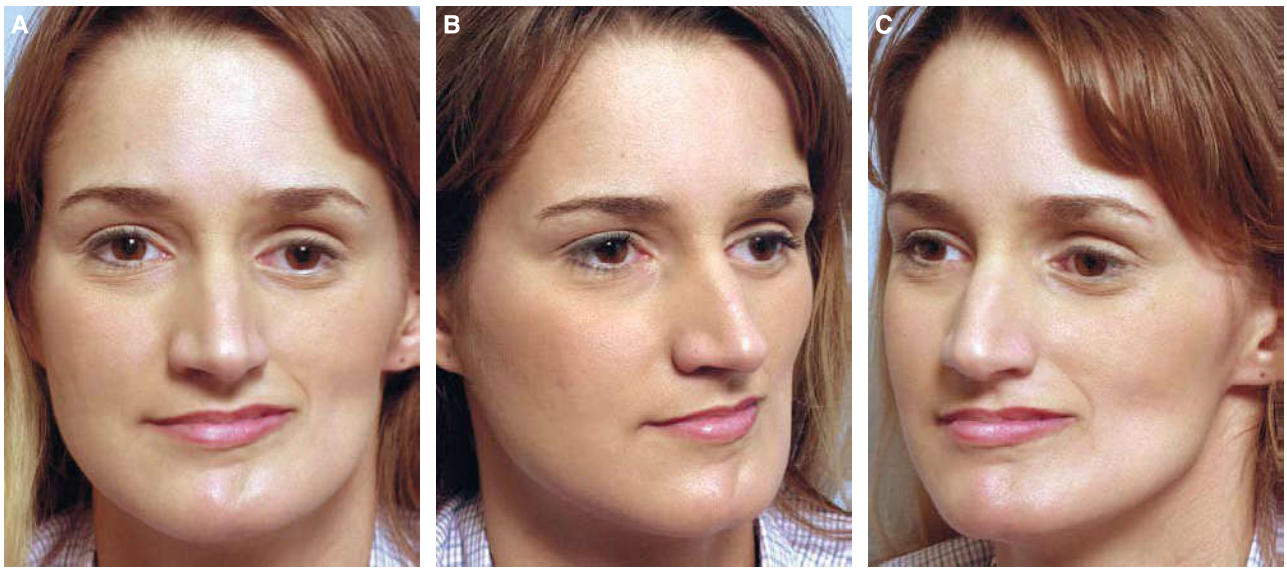


FIG. 10-31, cont'd

The surgical plan is shown above. Because of the extreme thinness of the atrophied tissues, only a limited amount of grafted fat could be supported at one time. We anticipated and performed three grafting sessions a year apart to reach our goal. Drawing the plan for this type of patient is quite challenging, because the surgeon must envision three-dimensionally how to create normal anatomy and symmetry from these random but severe contour defects. We find it helpful to first draw true topographic lines reflecting depth of the defect *(black)*, then to superimpose the aesthetic units of the malar complex and the chin *(green)*.

FIG. 10-31, cont'd

These preoperative and postoperative views illustrate how microfat grafting can yield a beautiful aesthetic result with minimal trauma, even in cases of multiple severe contour deformities.

Another example that demonstrates the tour de force achievable by microfat grafting for multiple severe contour deficiencies in a purely aesthetic case will be discussed with Fig. 10-47.

Long-Term Survival and Stability of Microfat Grafting

When liposuction was first introduced into America in 1982, it was only a short time before surgeons were trying to use the liposuction aspirate for augmenting sunken areas. We found only sporadic, unpredictable survival of results, and of only a tiny percentage of grafted material.

In 1995 Coleman showed conclusively that by harvesting 1 to 2 mm particles (the largest that will pass undamaged through a Luer-Lok syringe hub) and using a meticulous drop-by-drop technique for grafting, predictable survival of a relatively high percentage of grafted fat could occur. He showed this using serial photographs of several patients, taken at precisely the same angle, over a period of years.

FIG. 10-32

The current series of patients confirms not only the long-term survival, but the stability of microfat grafting. The patients in this report are at least a year postoperative. This 52-year-old woman is shown before and 3½ years after microfat grafting to the malar area. The rotation of the head is nearly identical on both photos, and it is clear that the grafted fat has not only survived, but remains well positioned and symmetrical.

FIG. 10-33

This 39-year-old woman underwent a MACS-lift and microfat grafting to her lips and malar areas. Three months postoperatively, a little swelling is still present. At 5 years, the lips and cheeks remain full, and at 8 years there is virtually no decrease in the fullness of her lips, nor of her cheeks. There is no perceptible ptosis of the grafted cheek fat from age 39 to 47, despite the patient's passing through menopause. We feel it is safe to conclude that the fat that remains at 1 year will be there indefinitely, because the small particles are intimately integrated in the recipient tissue. It is also clear that the grafted fat is stable, maintains its shape, and resists gravity at least as well as the native tissue. These characteristics, and the fact that it is readily available, looks and feels totally natural, and is always biocompatible, make microfat grafting a nearly ideal resource for aesthetic plastic surgeons. In fact, microfat grafting is

an extremely useful technique at the other end of the spectrum for large volume augmentation. The senior author has one of the largest series in the English language literature of augmentation of the buttocks by microfat grafting, currently more than 350 cases. In this area, the ability to not only augment, but also to create a feminine shape where there was none, to literally resculpt the torso, and to have the shape last as long as if it were the original body shape, is a gift no other procedure can offer. Augmentation of up to 1000 cc per buttock is routinely performed, and we have photographic documentation of the volume and shape remaining unchanged in several patients now up to 6 years postoperatively.

Complementary Procedure 2: Laser Resurfacing

With microfat grafting we have the ability to add volume and contour to our facial sculpture. But what about the quality of the surface—the effects of aging and solar damage on the skin, the wrinkles, crêpiness, and splotchy pigmentation? Before 1993, phenol peels were available in which the acid was applied, the face was covered with tape or thymol iodide, then the surgeon prayed for 2 weeks that the facial skin would recover. It usually did, and a lot of the wrinkles were gone, but the skin always became ghostly white. It was all-or-none; there was no in between.

Then Obagi introduced trichloroacetic acid (TCA) peels. It was claimed that TCA offered controllable degrees of depth of peeling, for example, by reading the degree of *frosting* of the skin and the presence or absence of *epidermal sliding*. However, there was a flaw: these signs were adequate for judging superficial peels, but there was no way of knowing with a deeper peel when the line had been crossed from upper dermis to deep dermis, and the increase of hypertrophic scarring with the deeper TCA peel was unacceptably high.

In 1993 the senior author began hearing rumors about a laser that could "erase wrinkles." I visited dermatologist Richard Fitzpatrick in San Diego, who had done the pioneering work with the CO_2 laser, and he generously shared his experience with me. I began using the laser on some of my patients and was very impressed not only with its ability to minimize wrinkles, but also with the degree of control and predictability it offered. I made the first presentation on the concept of laser resurfacing to our specialty at the 1995 meeting of the American Society for Aesthetic and Plastic Surgery.

Almost simultaneously but separately, Jay Burns and Brooke Seckel also recognized the potential role of the CO_2 laser for facial rejuvenation. The original device had only a manual handpiece, making it extremely operator dependent, and reports of hypertrophic scarring were not uncommon. However, when CO_2 laser surgery was done properly, the results could be remarkable.

FIG. 10-34

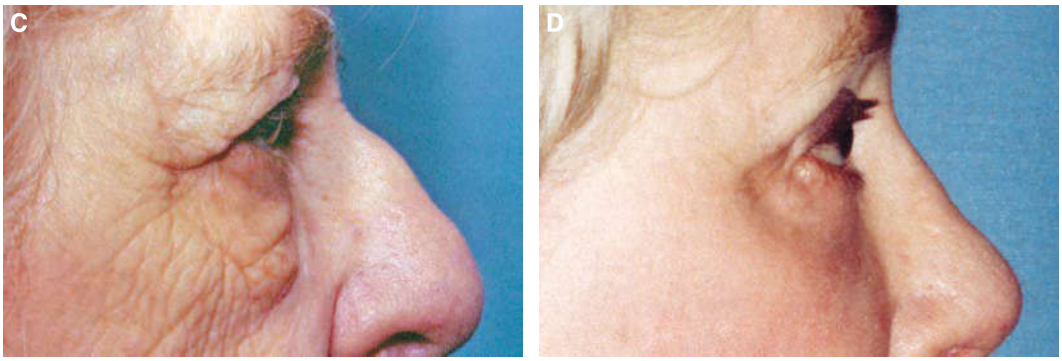
This 76-year-old patient was presented live at our first teaching course in 1995. The patient had undergone total facial laser resurfacing and simultaneous face lift and blepharoplasty 4 months previously. No other technique except a phenol peel could have come close to these results, and no one would dare to do a total facial phenol peel at the time of a face lift. Those who saw her in person rapidly entered the *zealot phase*. Because virtually all of our early laser patients were fair-skinned women in their fifties to seventies, the problem of hypopigmentation did not become apparent until about a year later, when following up a man with fairly dark Caucasian skin. His result was pleasing at 6 months, but by 12 months he had slight lightening of his skin. By 18 months, his skin was almost as white as after a phenol peel. Because of this hypopigmentation and the potential for hypertrophic scarring, we became much less aggressive in our resurfacing. Scarring became a nonissue, and the hypopigmentation was decreased to an acceptable level, if the boundaries of resurfacing were feathered. The intense erythema (think lobster) often lasted 6 to 12 months and was difficult to conceal, even with makeup. Those who were doing most of the clinical research with the CO_2 laser (Jay Burns, Brooke Seckel, Cynthia Weinstein of Australia, Gary Rosenberg, and myself) felt that the degree of erythema was necessary to obtain the striking results of tighter, more elastic skin. Some were experimenting with the erbium:YAG laser, which caused less erythema, but also less skin tightening.

The Sciton dual mode erbium:YAG laser was developed to achieve the same wrinkle-erasing effect as the CO_2 laser, but with half the intensity of the erythema (pink instead of lobster red), and literally half the duration of erythema (that is, 1 to 3 months instead of 6 to 12 months). This device combines two erbium:YAG lasers—one for ablation and one for heat-shrinking with an ultra-

long pulse width. This laser opened many new possibilities, especially that of regional resurfacing. The CO_2 laser created so much redness that if the surgeon attempted to resurface around the eyes and mouth, the alternating bands of white forehead, red eyelids, white cheeks, red mouth, and white neck were impossible to conceal. However, with the Sciton, the mild pinkness and its short duration made it feasible to do regional resurfacing. Now, after over 12 years of experience, the role of laser resurfacing has become clearer.

Laser resurfacing is rarely used by surgeons as a stand-alone treatment, although some dermatologists do this. The most common application is periorbital and/or perioral resurfacing, which are the two areas where most facial wrinkles are found. Laser resurfacing is uniquely effective (and unequalled) for rejuvenating the periorbital area, which is the thinnest skin on the body, often in the range of 300 to 500 microns (0.3 to 0.5 mm). Because this laser can reach a depth of about 200 to 250 microns (over half the thickness of this skin), it gives remarkable tightening of the loose skin around the eyelids. The periorbital skin is often dark, as seen in Fig. 10-34, *A*, and this is the one place a little lightening of the skin is desirable and not a problem. One can see how much better the periorbital skin is in Fig. 10-34, *B,* both in texture and color match with the face. With minimal feathering of the edges, there is virtually no demarcation around the eyelids.

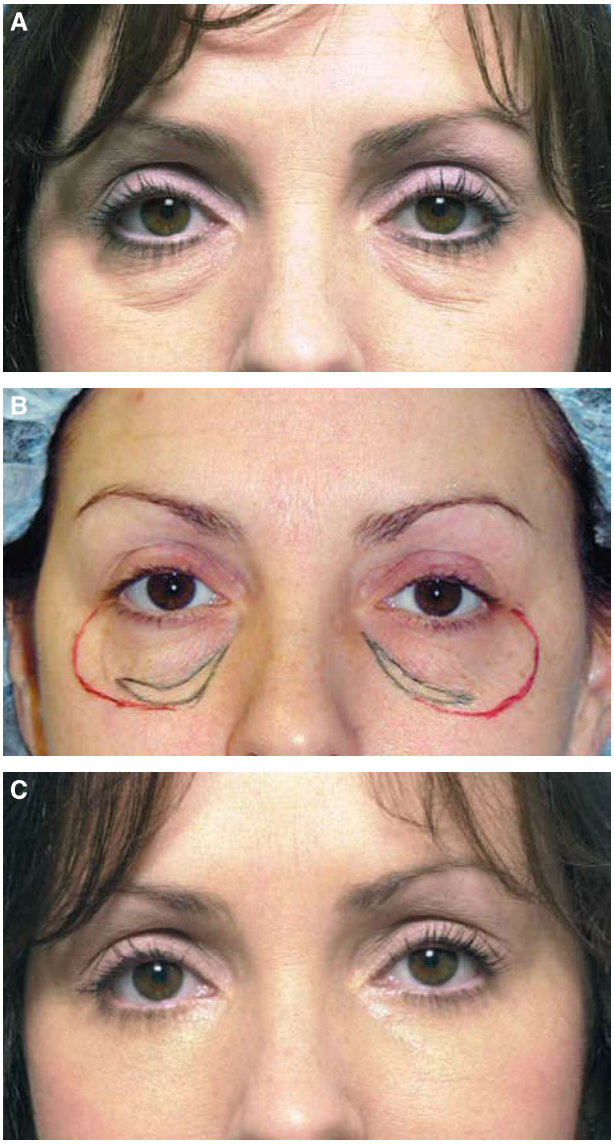
FIG. 10-34, cont'd



In older patients, malar bags and festoons may be present (see Fig. 10-34, *A* and *C*), and there is no technique that can come close to the laser's ability to improve or eliminate malar bags (see Fig. 10-34, *B* and *D*). The amount of energy (Joules/cm^2) delivered to the skin is completely controllable and affects only the top 250 microns, so it is safe (in experienced hands) over undermined skin, which means it can be used simultaneously with endobrow lift, blepharoplasty, and even (conservatively) a face lift. As mentioned previously, no other

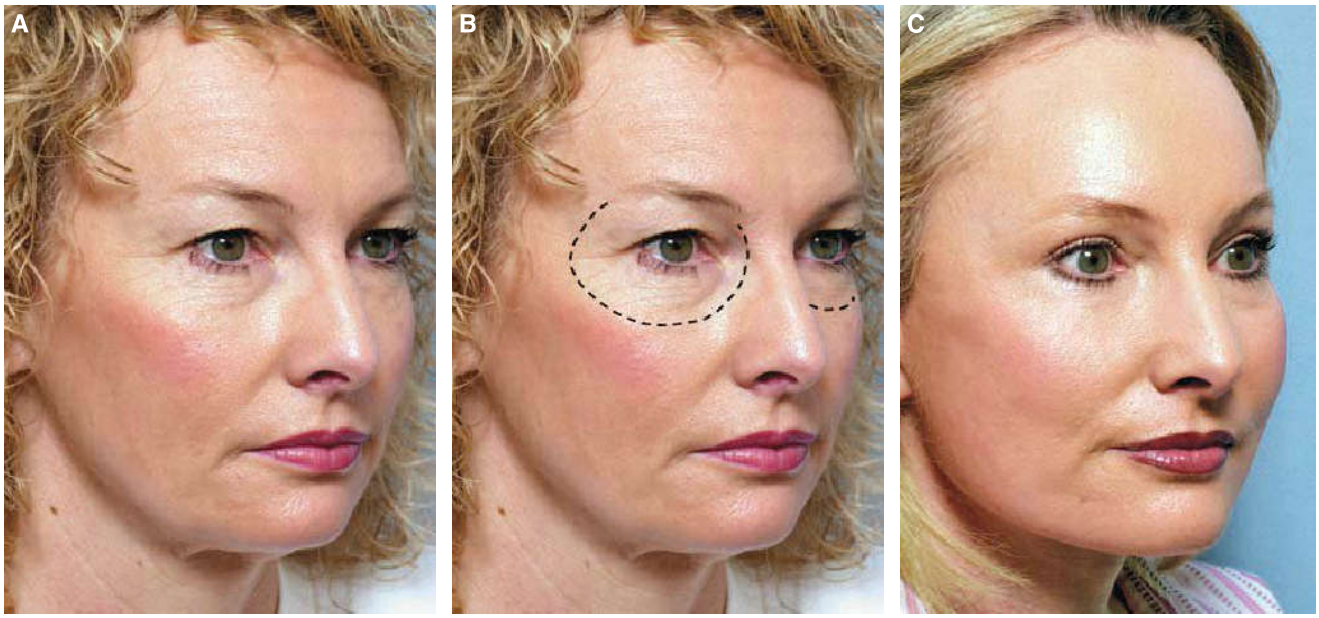
resurfacing modality (phenol peel, TCA peel, or dermabrasion) can be used when these surgical procedures are done. This now means that a patient can have comprehensive facial rejuvenation, including rejuvenation of the skin, at one sitting.

FIG. 10-35



Even for early aging changes around the eyelids, such as those seen in this 39-year-old patient, the laser plays an irreplaceable role. When combined with a lower transconjunctival blepharoplasty and a little microfat grafting to the tear trough, the laser resurfacing makes her look 25 or 30. The blepharoplasty alone, or combined with microfat grafting, could not have had this effect without the laser.

FIG. 10-36

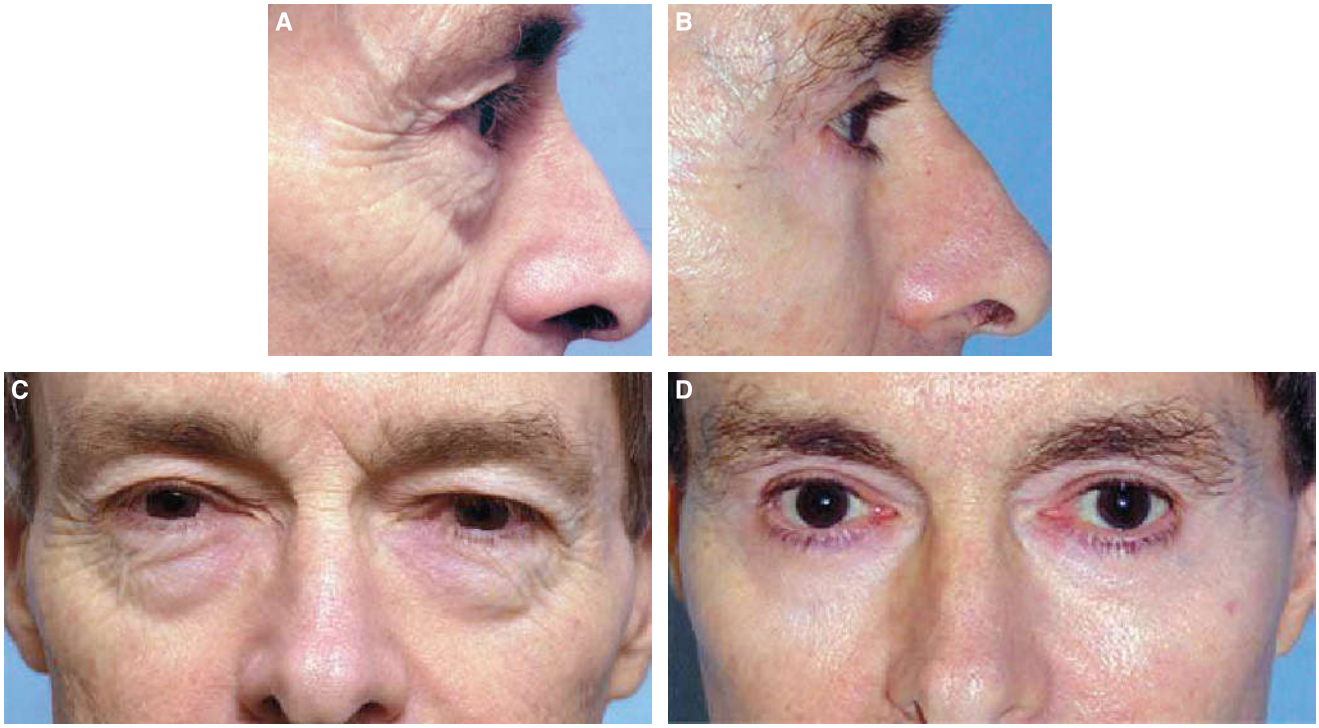


Aesthetic Problems	Surgical Plan
Eyes look tired (crêpey, fine wrinkles)	Four-lid transconjunctival blepharoplasty No brow lift
Early aging: The lid-cheek junction is visible and apparent height of lower lid is lengthened	Periorbital laser resurfacing smoothes and gives youthful texture to skin and obscures the lid-cheek junction
Slight facial and neck laxity	MACS-lift

The periorbital area of this 51-year-old woman has developed crêpey, redundant skin in the upper lid, with wrinkles in the lower lid and crow's-feet. The apparent height of the lower lid is beginning to increase and the lid-cheek junction is becoming apparent. There are also some early dark circles under her right eye.

The blepharoplasty helped with the loose skin of her upper lid, and the MACS-lift with anterior platysma repair gave her a crisp neck and jawline, but the laser resurfacing outlined in Fig. 10-36, *B*, gave the fresh, sparkling look to her eyes, eliminated the wrinkles and dark circles under the eyes, and made the lid-cheek junction imperceptible.

FIG. 10-37

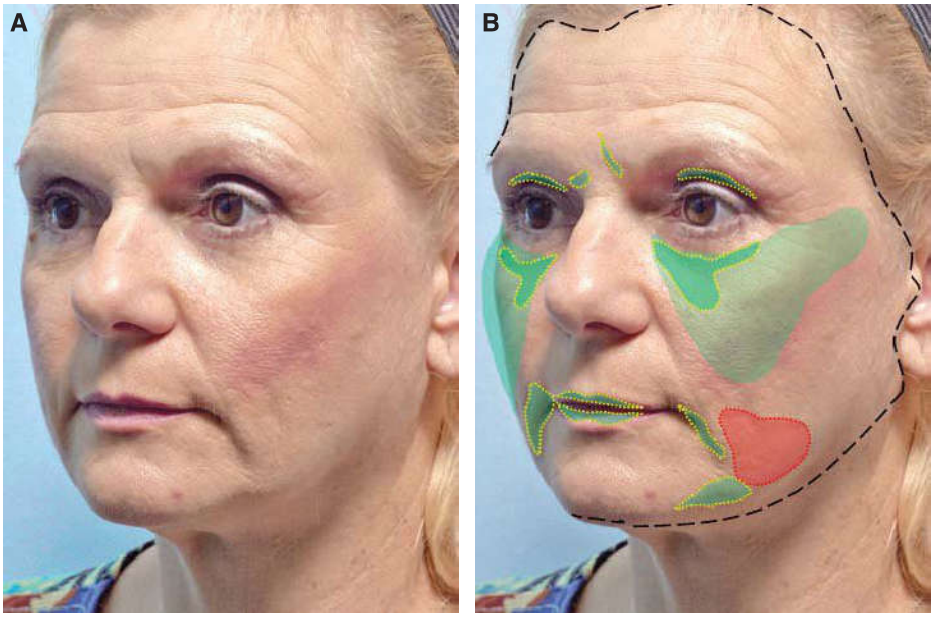


The periorbital region of this 63-year-old man exhibits more advanced signs of aging including ptosis of the brows, causing the upper lids to literally hang over the eyelashes. The deep forehead lines show that he frequently has to raise his brows to clear the upper field of vision. The malar fat has become atrophic and/or ptotic, causing a large, wide tear trough. On lateral view, the malar-facial groove can be clearly seen as a depression extending downward from the tear trough, between the malar eminence and the nose. The eyelid bags are pronounced. He is very light sensitive and squints a lot (chronic orbicularis oculi contraction), which is the cause of the dozens of deep wrinkles radiating out through the upper and lower lids and the crow's-feet area.

Traditional surgery could not possibly have produced the crisp, smooth eyelids and cheek bones seen on lateral view 1 year postoperatively. In addition to blepharoplasty, he required microfat grafting to the tear trough, malar-facial groove, and cheek bones, and laser resurfacing to smooth it all down. A minimal endobrow lift was performed to unload the upper lid.

Total Facial Laser Resurfacing

FIG. 10-38



Aesthetic Problems	Surgical Plan
Deep forehead lines caused by chronic frontalis muscle contraction to clear visual field	Endobrow lift
Frown lines Hollow upper lids Mild tear troughs and malar facial grooves	Microfat grafting to infrabrow/upper lids, frown lines, tear trough, malar facial groove, marionette lines, and lateral chin
Lack of malar projection Deep marionette lines Thin lips Lateral chin notch	Microfat grafting for augmentation of cheek bones and lips
Mild jowling Facial and cervical laxity	Minor liposuction of jowls and neck
Platysma banding	MACS-lift with anterior platysma repair
Facial rhytids, coarse skin with large pores	Total facial laser resurfacing

This 52-year-old woman presented with sun-damaged skin and had deep, ingrained wrinkles in her forehead, multiple long crow's-feet wrinkles, and a coarse look to her cheek skin, with large pores clearly visible.

The treatment plan included total facial resurfacing, along with an endobrow lift, microfat grafting of the areas shown, and liposuction of the jowls. *Green* signifies areas for grafting, *red* for liposuction, and *black* outlines the area for laser resurfacing.

FIG. 10-38, cont'd

These treatments gave her a youthful look 1 year postoperatively with fresh, clear, smooth skin and full lips. A full face lift was performed to treat her neck, jowls, and jawline.

FIG. 10-39

Although this woman had multiple signs of aging (brow ptosis, facial and cervical laxity, jowling), her dominant problem was severe ingrained wrinkling of the entire face. A face lift and neck lift alone could never have given this degree of improvement; only the additions of total facial laser resurfacing could have given this result. Conversely, resurfacing alone would fall short of this result. The synergy of all her procedures has given her a dramatic but natural-appearing rejuvenation.

By age 62, the patient had developed wrinkles all over her face. The rugae on her upper lip, forehead lines, frown lines, crow's-feet, wrinkles of the upper and lower eyelids, and even the cheeks and jowls had ingrained wrinkles. No amount of pulling via face lift could (or should) be able to smooth these out, but when combined with total facial laser resurfacing, liposuction of the jowls, and a brow lift, the result is a sparkly look and the skin of a woman 20 years younger (not only with fewer wrinkles, but more uniform in pigmentation). Typically with the Sciton laser, we use an energy density of 20 Joules/cm^2. This laser is also calibrated to show the depth of tissue being treated. The pulses are alternated by a revolving mirror. It can be set for either ablation or coagulation (heat-shrink), or a combination. We generally use an 80-micron depth of ablation. Combining this depth with 50 microns of coagulation helps minimize bleeding and gives some heat-shrink effect. Together, these parameters deliver 20 Joules/cm^2. The third and final parameter is *percent overlap;* 50% is

enough to give uniform effect and avoid pattern imprinting. CAUTION: Resurfacing over skin that has been or will be undermined must be conservative, usually one pass posteriorly (there are generally no or few ingrained wrinkles in the posterior half of the cheek, so lasing here is primarily done to achieve color blending). CAUTION: Using only one pass on an area can result in *pattern imprinting,* with individual dots being visible on the skin. Generally, the second pass blurs the image of the first pass; this is one reason that laser resurfacing over undermined skin should not be undertaken until one has significant experience with treatment and long-term follow-up.

The rugae in the upper lip require special attention: before resurfacing the lip with the computerized pattern generator, we use the manual handpiece with a pure ablate setting to sculpt down the shoulders of these ridges; this may take several passes with the manual handpiece, so the patient should be warned that each furrow will have a pair of vertical pink lines where they were lased down that will stay pink much longer than the lased skin in general. After lasing the ridges down to the level of the surface of the lip, one or two passes are made with the computerized pattern generator (CPG) if additional smoothing is needed for the rest of the lip. CAUTION: There is no visual endpoint with the erbium:YAG laser, and overzealous pursuit of the rugae can result in hypertrophic scarring, to which the upper lip is especially susceptible. Whenever the surgeon deems it necessary to do more aggressive resurfacing, he or she must feel these areas with bare finger tips twice a week for 3 weeks, looking for any area of firmness that might suggest incipient scarring. Such firmness, if found, should be injected immediately with triamcinolone. This problem is a rare occurrence, and the results shown in Fig. 10-39, *B,* are well worth the small risk.

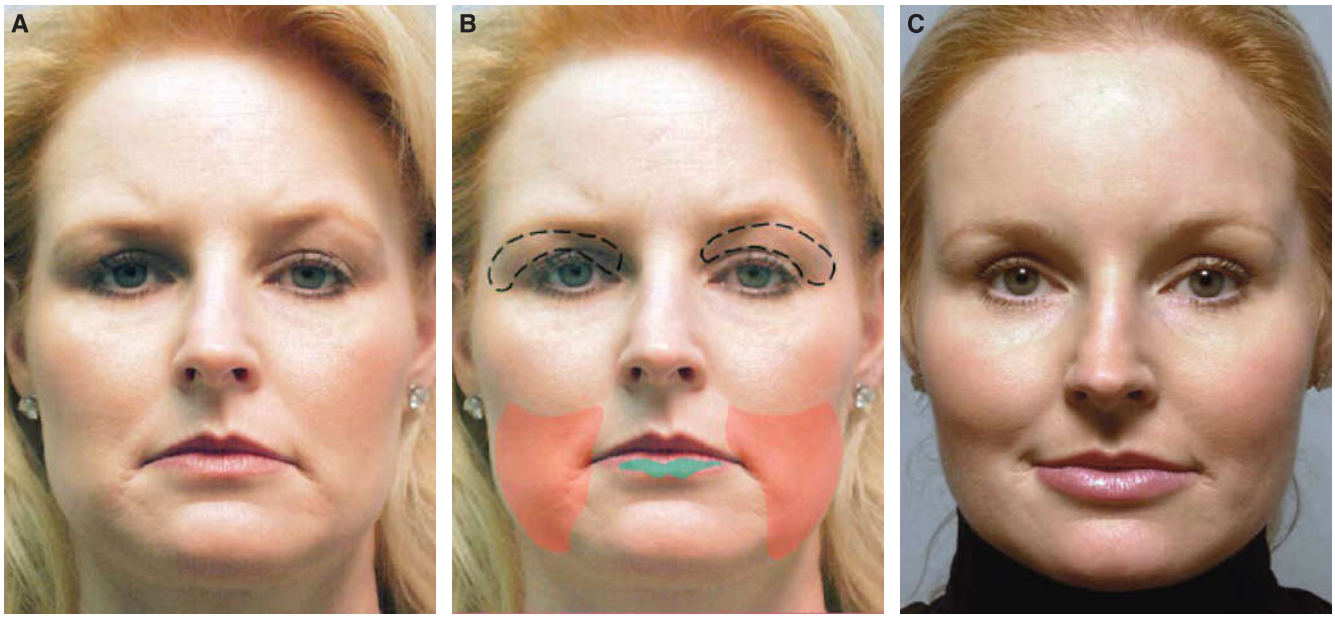
Complementary Procedure 3: Judicious Facial Liposuction

Before the advent of autologous fat grafting, surgeons were afraid to perform liposuction on the face for fear of causing irreversible depressions. Now, however, because of increased experience with judicious facial liposuction and microfat grafting, conservative liposuction with a fine cannula (1.5 to 2.5 mm diameter) is a technique employed by many aesthetic plastic surgeons. CAUTION: Facial liposuction (that is, of medial cheeks and/or jowls) must be performed with a syringe and not a machine, so that precise measurement of fat removed is possible. We use a 50 cc syringe with a simple locking device to hold the vacuum. CAUTION: It is crucial to know the volume of fat removed and not just of the aspirate. If the aspirate is bloody, we centrifuge it to know the exact amount.

FIG. 10-40

If one side of the face is swollen or ecchymotic from the local anesthetic injection, the other side should be liposuctioned first to determine the volume of fat to remove to give the desired appearance. It may be as little as 1 to 2 cc or as much as 10 cc per side, as in this man. CAUTION: One should never or rarely liposuction any folds just lateral to the oral commissures. This skin is tethered to the underlying muscles, and the fat between these layers provides padding to keep skin full and firm. In addition, patients having a face lift often already have some laxity of the skin lateral to the corner of the mouth; therefore, if even a small amount of this fat is removed, the result after swelling is gone may be several very noticeable loose folds lateral to the mouth, which more or less parallel the nasolabial fold. This is a real dilemma, because it is unlikely that even a second face lift will improve these folds; generally, only direct excision of the loose skin (with the scar placed in the exact location of the nasolabial fold) will reduce them, but at the cost of the visible scar. It is difficult to restore the *packing function* of this fat by microfat grafting.

FIG. 10-41



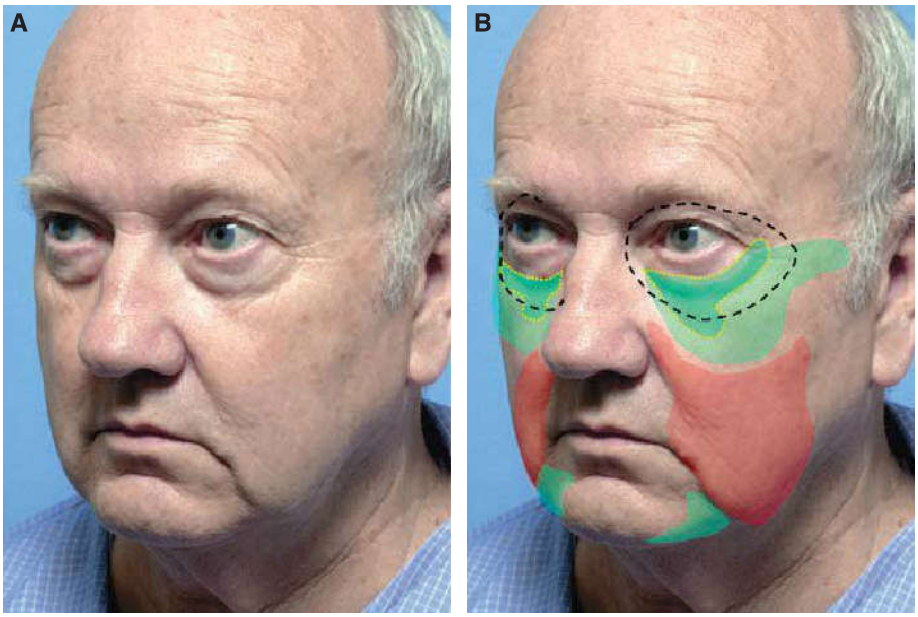
Aesthetic Problems	Surgical Plan
Harsh or critical look secondary to frown lines and brow ptosis	Endobrow lift with corrugator resection
Crêpey upper lids	Laser resurfacing of upper periorbital area
Loss of definition of cheeks secondary to heavy jowls	Liposuction of jowls No cheek augmentation
Thin lower lip	Microfat grafting to lower lip

This 37-year-old woman is an ideal candidate for judicious liposuction, and in fact, there is no other good way to deal with these heavy medial cheeks and jowls. The fullness of the jowls is her main aesthetic problem, which makes her look heavy and blunt at her jawline, obscures her cheeks, and makes her face look square.

The harsh frown lines and heavy brows required an endobrow lift, and she also wanted more fullness in her lower lip. *Green* indicates areas for grafting, *red* for liposuction, and *black* outlines areas for laser resurfacing.

The result of this combination of procedures is stunning, and shows the power of carefully performed liposuction as a tool for sculpting the face and improving its proportions. No cheek augmentation was done; only liposuction in the areas indicated.

FIG. 10-42

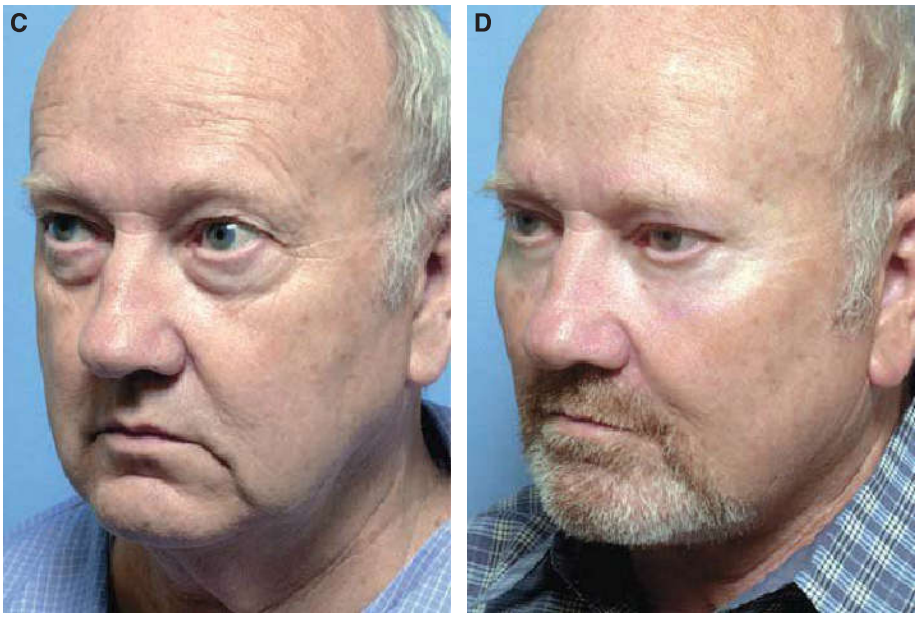


Aesthetic Problems	Surgical Plan
Unnecessary brow elevation and forehead wrinkling secondary to superior visual field cut by upper lid	Four-lid blepharoplasty
Scleral show	Lateral canthal suspension
Lower lid bags and wrinkles	Laser resurfacing of periorbital area
Tear trough Malar hypoplasia	Microfat grafting to tear trough, malar area, and lateral chin
Jowling	Liposuction of medial cheeks/jowls
Notching of mandibular margin at lateral chin	Microfat grafting to lateral chin notch
Facial and cervical laxity	Face and neck lift

At the other end of the spectrum is this 63-year-old man. He disliked his jowls, but also had a hypoplastic zygoma, which gave him deep tear troughs, no cheek projection, and poor support for his lower lids; his inferior orbital rim was almost 12 mm posterior to the cornea. This lack of lid support also led to scleral show, and his shallow orbits gave him a bug-eyed or exophthalmic appearance that he disliked. The decreased superior visual field caused by his redundant upper eyelids caused him to constantly hold his brows elevated. This, in turn, caused deep creasing of the forehead. CAUTION: A lower blepharoplasty alone could create three problems in the presence of shallow orbits and preexisting scleral show. First, removal of any lower fat could reveal the contour of the globe more and increase the bug-eyed appearance. Second, scleral show may worsen, especially if any skin is resected. Lastly, if a traditional horizontal lid-shortening procedure is done to treat the scleral show be-

cause the lid is already below the equator of the globe, simply shortening or tightening the lower lid without an upward displacement of its point of support (the lateral canthus) will result in an even lower lid position (that is, increased scleral show and exophthalmic appearance). This situation requires a lateral canthopexy, which we will discuss shortly. His surgical plan required a full face and neck lift to deal with the large amount of loose jowl and neck skin.

FIG. 10-42, cont'd



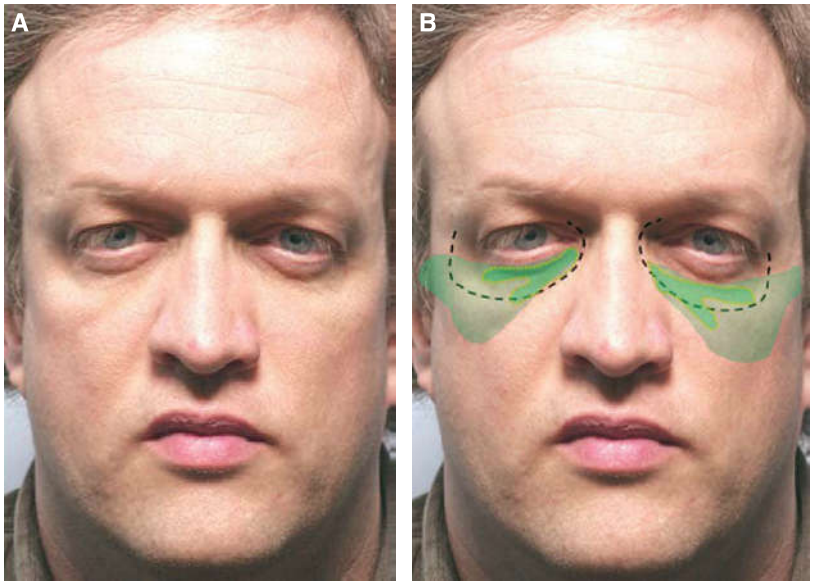
His results are shown. The beard was his idea—he felt that it made him look younger (and hence closer in age to his younger wife). There is dramatic improvement in the contour of his face. The liposuction of the jowl with the augmentation of the malar area definitely had a synergistic effect: Combined with the periorbital work, he does look 15 or 20 years younger.

Notice also how the visually and functionally deficient inferior orbital rim was built out by microfat grafting. A very difficult task has been accomplished: The exophthalmic appearance has been eliminated (see also Fig. 10-53 and the accompanying discussion for more on this topic). The actual evaluation of his lid margin was only possible by adding the lateral canthal suspension to give a vertical vector to the support system of his lower eyelids.

Complementary Procedure 4: Lateral Canthal Suspension

A lax lower lid and/or scleral show or *lateral droop* is an extremely common problem in anyone over age 50. This was formerly a common complication after skin-resection blepharoplasty and after a transblepharoplasty midface/cheek lift. It also may be present from birth, and is often caused by subclinical or full-blown malar hypoplasia. Lateral canthal suspension, the technique we use for lateral canthopexy, is one solution to these problems.

FIG. 10-43



Aesthetic Problems	Surgical Plan
Facial disproportion: malar hypoplasia (transversely and anteriorly) Resultant narrow, long face	Microfat grafting to malar area, zygomatic arch, and inferior orbital rim
Resultant drooping of lateral canthus and rounding of lateral lower	Upper blepharoplasty with lateral canthal suspension
Dark circles under eyes: shadows and hyperpigmentation	Laser resurfacing to reduce darkness of the periorbital skin
Tear trough	Microfat grafting to tear trough and lower lid
Ptosis of brows	Endobrow lift

The key to understanding and treating this patient is to perceive and diagnose not just a weak cheek bone, but the presence of panhypoplasia of the malar complex:

1. *Hypoplasia of the inferior orbital rim* (Fig. 10-43, *C*), revealing the shape of the globe and giving him:
   - A slight exophthalmic appearance
   - Poor support for the lower lid and globe
2. *Hypoplasia of the zygomatic (inferior) portion of the lateral orbital rim:*
   - Revealing shape of the globe on the lateral view
   - Even more important, resulting in an extremely low position for the lateral canthal tendon, which in turn results in a marked downward slant of the eyelids (Fig. 10-43, *A*). In a normal Caucasian man or woman, the lateral canthus should be about 2 to 3 mm above the medial canthus. In this case, the patient's lateral canthus is almost 4 mm *below* his medial canthus. This distance, in addition to his brow ptosis and a slight frontal bossing, gives him a peculiar look. This somewhat strange appearance is further enhanced by the following.
3. *Hypoplasia of the zygomatic arches,* which is detected as *narrowness* of the skull laterally at the level of the inferior orbital rim, where it should normally be the widest (compare with Figs. 10-20, *C,* and 10-24, *A*).
4. *Hypoplasia of the malar eminence;* that is, the anteriormost projection of the cheek bone.

FIG. 10-43, cont'd

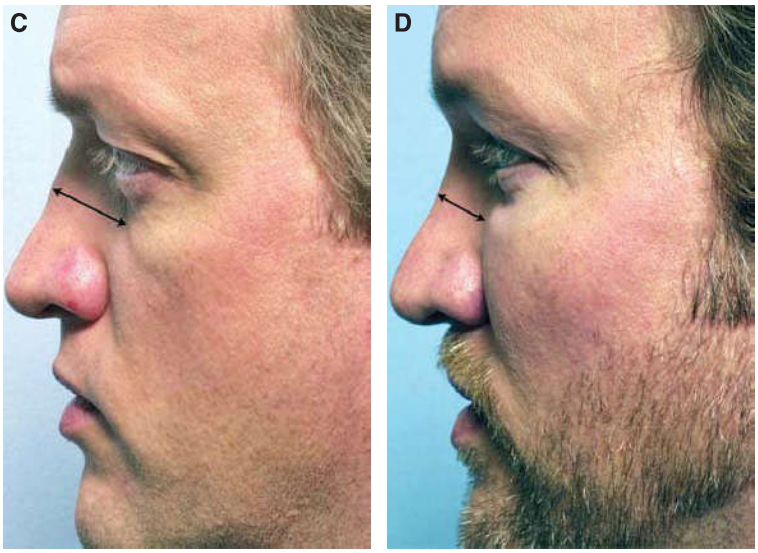
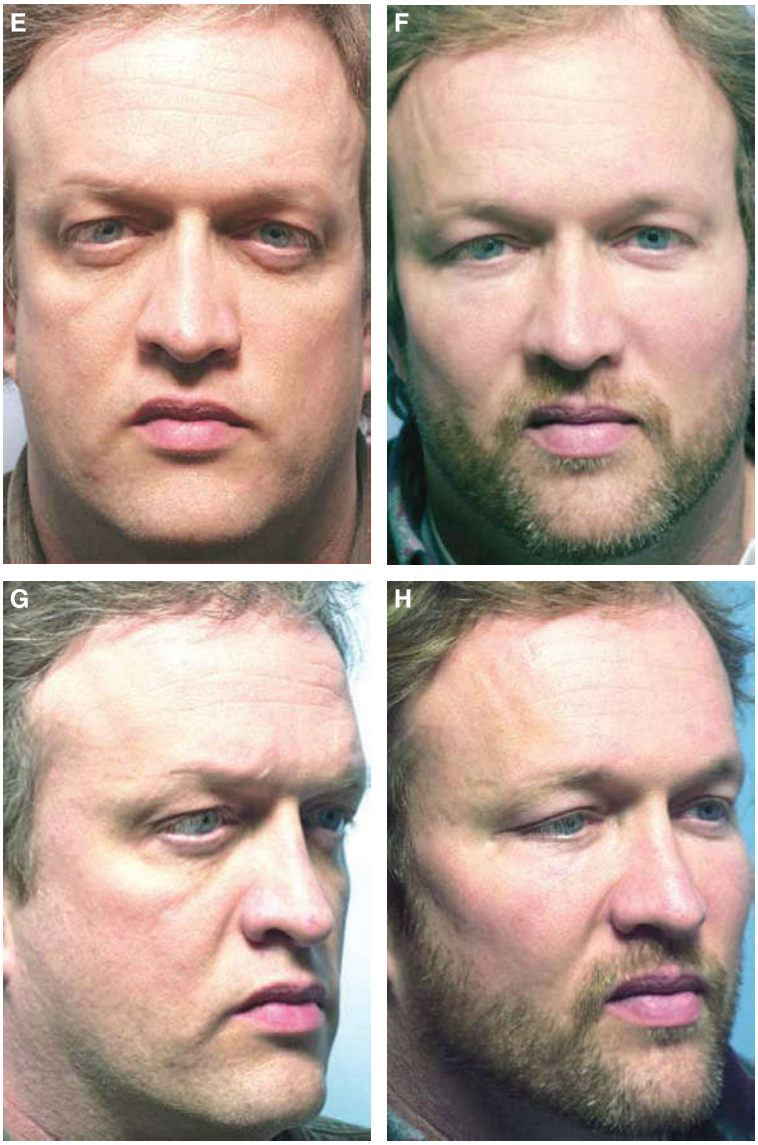


FIG. 10-43, cont'd



On the left cheek, the malar eminence makes only a tiny 2 mm elevation above the flattened left side of the face; by microfat grafting the profile of the cheek is brought to more normal (that is, pleasing) proportions. This required a complete build-out of the inferior orbital rim and indeed the whole zygoma (malar complex) by microfat grafting.

The result of building out the zygomatic arch and the illusion of rebuilding the floor of the orbit and lateral orbital rim is shown. The lateral canthus has been elevated to a near-normal level. This was accomplished by *lateral canthal suspension*.

The result of building out the inferior orbital rim and malar eminence is shown. These procedures were accomplished using only fat. Craniofacial surgery, bony orbital surgery, and bone grafts were not performed. This is truly structural fat grafting! Although I (T.L.R. III) had my training in craniofacial surgery, I believe in using a simpler technique when it is this effective (and much less invasive with fewer complications). The question surgeons should ask themselves is: Is a precise bony reconstruction required or does the patient just need to look normal?

The final pieces of the plan were: minimal endobrow lift with debulking of the corrugator to take away the continuous frowning or critical appearance, upper blepharoplasty, and laser resurfacing to decrease the darkness of the periorbital skin.

In the results for this patient, it is evident that the final result is greater than the sum of its parts (that is, the results are synergistic). He has transitioned (without cranioorbital surgery) from what he recognized as a "weird appearance" to a normal, even attractive, one. This change provided a huge increase in his self-confidence.

Lateral Canthal Suspension Concept

Lateral canthal suspension is a small procedure that can have a great effect. It can also be advantageous when working on a lax lower lid, in cases of overzealous skin resection during lower blepharoplasty, or in lasing the lower lid.

This technique meets several important criteria: it is quick (about 15 minutes for both eyes); once the surgeon is familiar with the anatomy, it is simple; it is done through the existing incision for upper blepharoplasty; and it is dependable, safe, and effective. We have never had a complication with it, except slight asymmetry early in my experience.

I (T.L.R. III) learned this procedure from Jelks about 12 years ago. He has now modified his technique slightly, and calls it the *lateral retinacular canthoplasty*, but I still find the original technique to be safe and effective in my hands. The lateral palpebral artery is an important landmark. This vessel passes directly through the lateral canthus area, and could be encountered at any time. An electrocautery unit and fine forceps should be readily available.

Lateral Canthal Suspension Technique

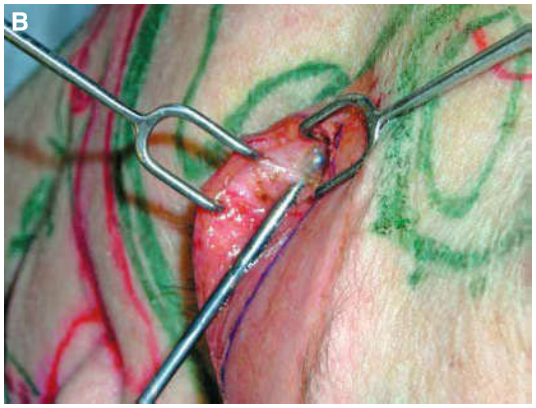
The incision used for an upper blepharoplasty is fine to use for lateral canthal suspension. If upper blepharoplasty is not planned, make a 2 cm incision in the lateral upper lid fold and extend it about 4 to 6 mm lateral to the canthus in a normal skin line slanting slightly upward.

Dissection is carried through and under the orbicularis oculi, and the lower half of the incision is elevated with skin hooks. The orbicularis oculi and the loose areolar tissue are freed from the lateral orbital rim.

FIG. 10-44

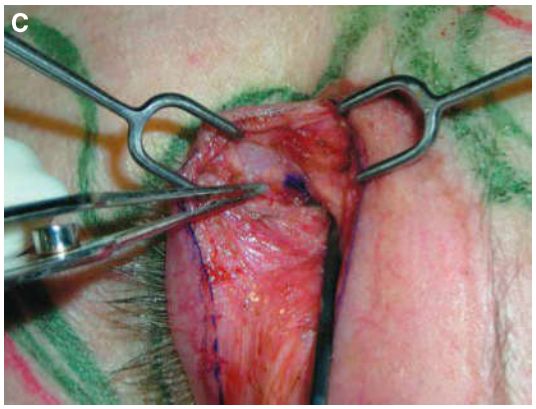
The right upper eyelid is seen from above. The orbicularis oculi has been opened parallel to its fibers. Scissors are in position to strum the lateral canthal tendon. The left double skin hook is repositioned under the cut lower edge of the orbicularis muscle so that it straddles the corner of the eye. Elevation on this hook puts tension on the lateral canthal tendon, which can be found by strumming across the soft tissue with a blunt tip such as Stevens tenotomy scissors, similar to plucking a banjo string. This tendon is usually tough and tendinous, but may be wispy. A thin but tough layer of fascia lies just medial to the periosteum. This fascia must be pierced before the lateral canthal tendon can be seen. We open this fascia by spreading Stevens tenotomy scissors medial to the lateral canthal tendon.

FIG. 10-44, cont'd



The probe is inserted under the lateral canthal tendon. Once the fascia is opened, the lateral palpebral artery may be anywhere around the tendon, so dissection is blunt, spreading with the tenotomy scissors. The tendon is again identified by strumming, and a segment about 4 mm long extending down toward its insertion onto Whitnall's tubercle is identified (Whitnall's tubercle is a lump of thickened periosteum 3 mm inside the orbit). The tendon is grasped with fine-toothed forceps as far below the orbital rim as possible and cauterized with the Bovie machine (to prevent an unpleasant surprise from the hidden palpebral artery).

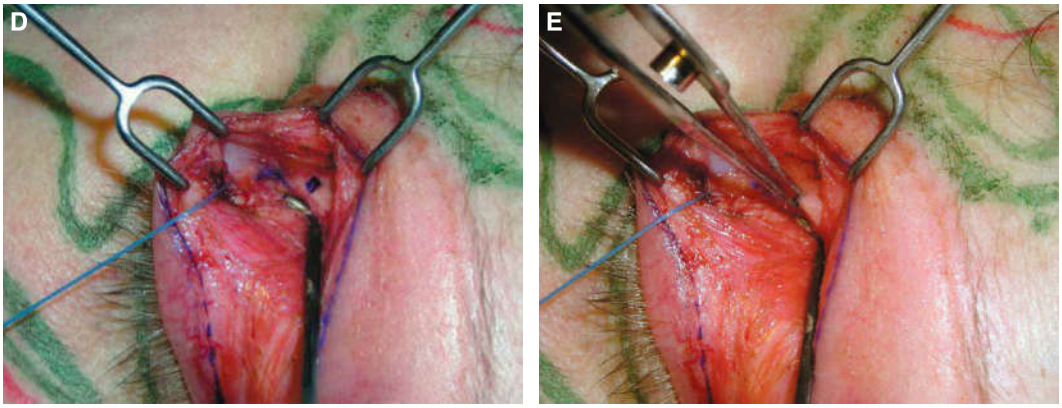
FIG. 10-44, cont'd



The lateral canthal tendon is cauterized and transected. Its origin at Whitnall's tubercle 3 mm inside the orbital rim is dotted with blue. The lateral canthal tendon is gradually transected between the forceps and the tendon insertion, as low as possible inside the orbit, watching for bleeding. As soon as it is transected, early in one's experience it is helpful to mark both stumps of the tendon with a tiny dot of methylene blue. The forceps grip on the stump of the tendon must not be released (it is difficult to relocate it among all the adjacent white structures; hence the tiny drop of methylene blue).

The stump of the tendon is pulled in an upward (cranial) direction and traction is placed on the tendon superiorly. The whole corner of the eye should move with it. If this does not happen, complete transaction of the tendon must be confirmed. The tendon is about 3 mm in diameter, explaining why the 2.5× surgical loupes are so helpful. If the corner of the eye still does not move after confirming tendon transaction, the reason is one or more fascial bands radiating down from the tendon to the inferior orbital rim similar to spokes of a wheel. While pulling on the tendon stump, the soft tissue below the forceps is strummed, and strands can be felt. Each band is lightly cauterized and cut with tenotomy scissors; at this point, the release of the canthus can be felt.

FIG. 10-44, cont'd



In Fig. 10-44, *D,* the black probe with a silver tip is seen just inside and below the lateral orbital rim; the second blue dot (above the probe) shows the fixation point about 4 mm above the original insertion on Whitnall's tubercle. In Fig. 10-44, *E,* forceps demonstrate the thick condensation of periosteum at the lateral orbital rim. The orbital stump of the lateral canthal tendon is dotted with a sterile marking pen, as is the orbital rim just lateral to that stump. A point on the orbital rim is marked about 4 mm higher than the first mark. There is always a distinct condensation on redundant periosteum at the lateral orbital rim, which Tessier said is "strong enough to lift the head off the table." If there is extreme lid laxity or the original site of the tendon was too low (less than 2 mm above the medial canthus), the upper dot may have to be 6 or even 8 mm above the level of the stump of its original insertion. CAUTION: Any elevation greater than 4 mm may result in an Oriental appearance, at least temporarily; the patient needs to be aware of this and must agree preoperatively.

A figure-of-eight suture, locked, should be passed through the tendon stump in the forceps. The second throw is passed through the tendon at 90 degrees to the first, and locked to obtain maximal purchase on the tendon. (I use 4-0 Ticron, USS No. 3058 on a ⅜ circle cutting 13 mm P-13 needle.) Before locking the suture, the surgeon should look inside the corner of the eye to make certain the blue suture has not transgressed the conjunctiva.

FIG. 10-44, cont'd

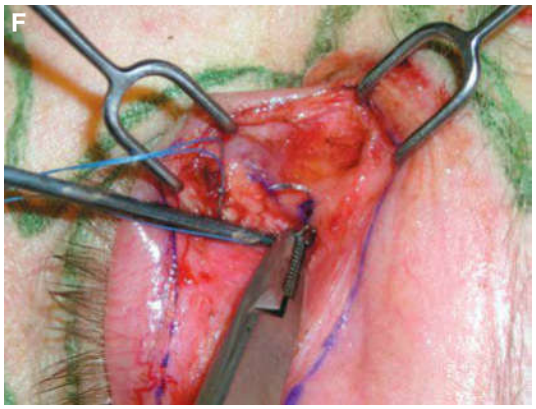
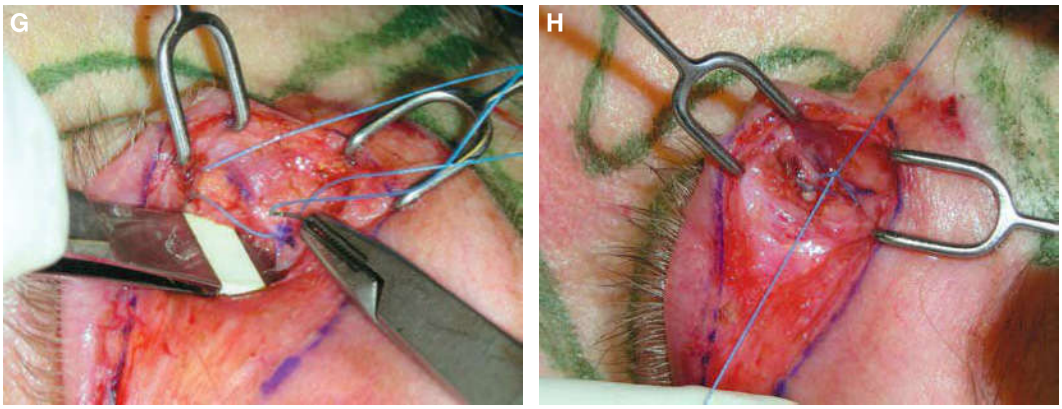


Fig. 10-44, *F,* shows the orbital contents reflected medially, away from the lateral orbital rim, and the needle is passed from 3 mm inside the orbit. If the lacrimal gland is encountered, it can simply be pushed farther back up into the orbit, out of the way. The needle must enter the periosteum 3 mm inside the orbit. A new, more superior insertion for the tendon is being created, and it must arise from 3 mm inside the orbit, similar to Whitnall's tubercle. CAUTION: If the suture instead only engages the periosteum at the level of the rim, the lateral canthus and lateral corners of the lid will diverge from the globe, leaving a strange-looking space between the lids and the globe. Therefore the needle must enter the periosteum 3 mm inside the rim, and hug the bone as it leaves the orbit out through the condensation of the periosteum of the lateral orbital rim, emerging as far laterally outside the orbit as possible, just inferior to the upper dot. The suspending 4-0 Ticron suture enters the periosteum 3 mm inside the orbit. As much periosteum is gathered as possible before exiting lateral to the orbital rim.

FIG. 10-44, cont'd

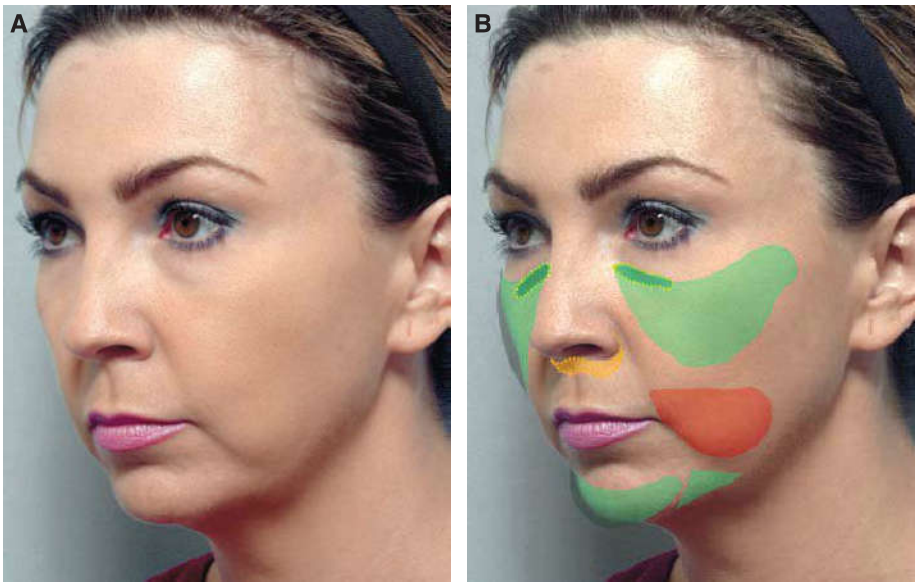


In Fig. 10-44, *G,* the direction is reversed and the needle is passed from the outside in, protecting the orbital contents with the back of the forceps. The periosteum is entered above the upper dot and several millimeters lateral to the orbital rim. The surgeon scrapes along the bone with the needle and exit as far down inside the orbit as possible to get as big a bite of the periosteum as possible. In Fig. 10-44, *H,* the suture is tied as tightly as possible, and the canthus can be seen snug up inside the orbit, but 2 to 3 mm higher (it does not follow 1:1). The knot is now inside the orbit, below the rim, where it cannot be seen or felt. The skin is closed as any other blepharoplasty. The lower lid is pulled downward; it should remain much higher and tighter than preoperatively. CAUTION: Because this repair attaches the tendon to periosteum and is not drilled into and secured in the bone, it may tend to relax over time. This has not been a problem clinically, but if there were some ongoing or repeated stress on the eye (for example, if the patient rubbed his or her eyes compulsively), we would recommend a more definitive attachment into bone.

Complementary Procedure 5: Subnasal Lip Lift

It is not uncommon for the upper lip to lengthen with age. It gives an unattractive appearance and is just one more distortion from ideal proportions that detracts from attractiveness.

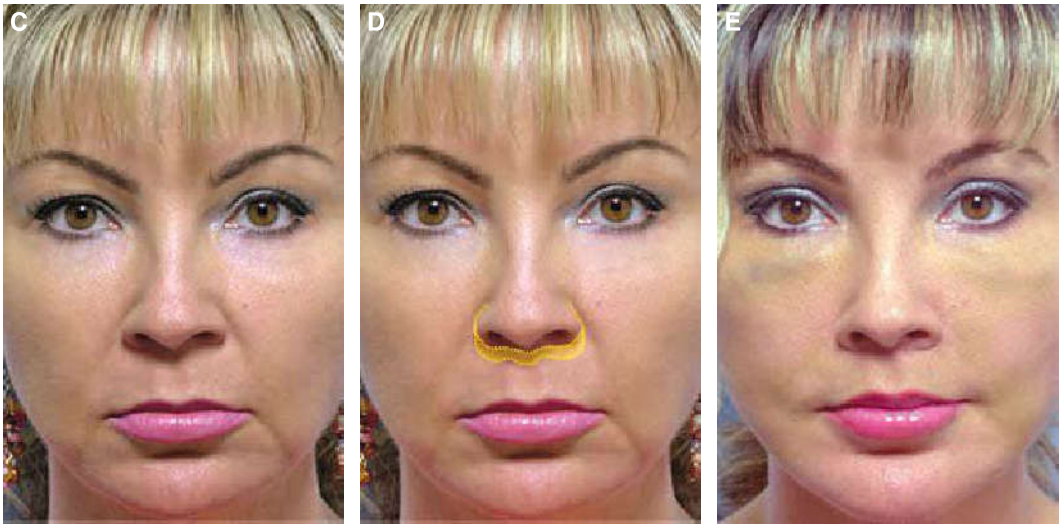
FIG. 10-45



Aesthetic Problems	Surgical Plan
Tear-trough deformity	Microfat grafting to tear trough
Lack of malar projection	Microfat grafting for augmentation of the cheek bone
Long upper lip	Subnasal lip lift
Mild jowls	Minor liposuction of jowls
Mild microgenia Mild lateral chin notch Short vertical height of mandible	Microfat grafting for augmentation of the chin and lateral chin notch, also increasing vertical height of mandible

The long upper lip is also seen occasionally in younger people, such as this 36-year-old woman. Although this degree of lip length alone might not be enough to motivate correction, this woman also wanted more fullness of her upper lip. Although the upper lip vermilion show is usually about 70% to 80% of the lower lip in attractive women, including supermodels, occasionally it can be up to 100% the size of the lower lip. These ratios vary dramatically with ethnic background, and even within a specific ethnic group, but in almost no group is an upper lip less than one third the size and height of the lower lip considered ideal.

FIG. 10-45, cont'd



The surgical plan consisted of removing a block of skin and subcutaneous tissue, as outlined in *yellow*.

The upper incision must hug the base of the nostrils and columella precisely; if done in this way, it is an imperceptible incision. The patient is shown 10 days postoperatively. Some ecchymosis from the microfat grafting to the tear trough and malar areas is still seen through her makeup.

If the desired goal is primarily to shorten a long lip, the tissue is excised and the lower edge of the incision is undermined for 2 to 3 mm, just above the level of the muscle.

If more show of vermilion is also desired, the skin can be undermined progressively farther, unfurling the vermilion. Results can be checked with a couple of sutures before continuing. If still more fullness is desired, microfat grafting can also be performed to the upper lip as soon as the incision is sutured.

The vertical width of the strip of skin excised depends on how conservative the surgeon and patient wish to be. CAUTION: There is no possible way to reverse this operation if too much is removed, so be conservative. It is easy to excise more later or even the next day, if necessary. Generally, removing 25% of the vertical height of the skin of the lip will give a conservative shortening of the lip and unfurling of the vermilion. The change is not quite 1:1.

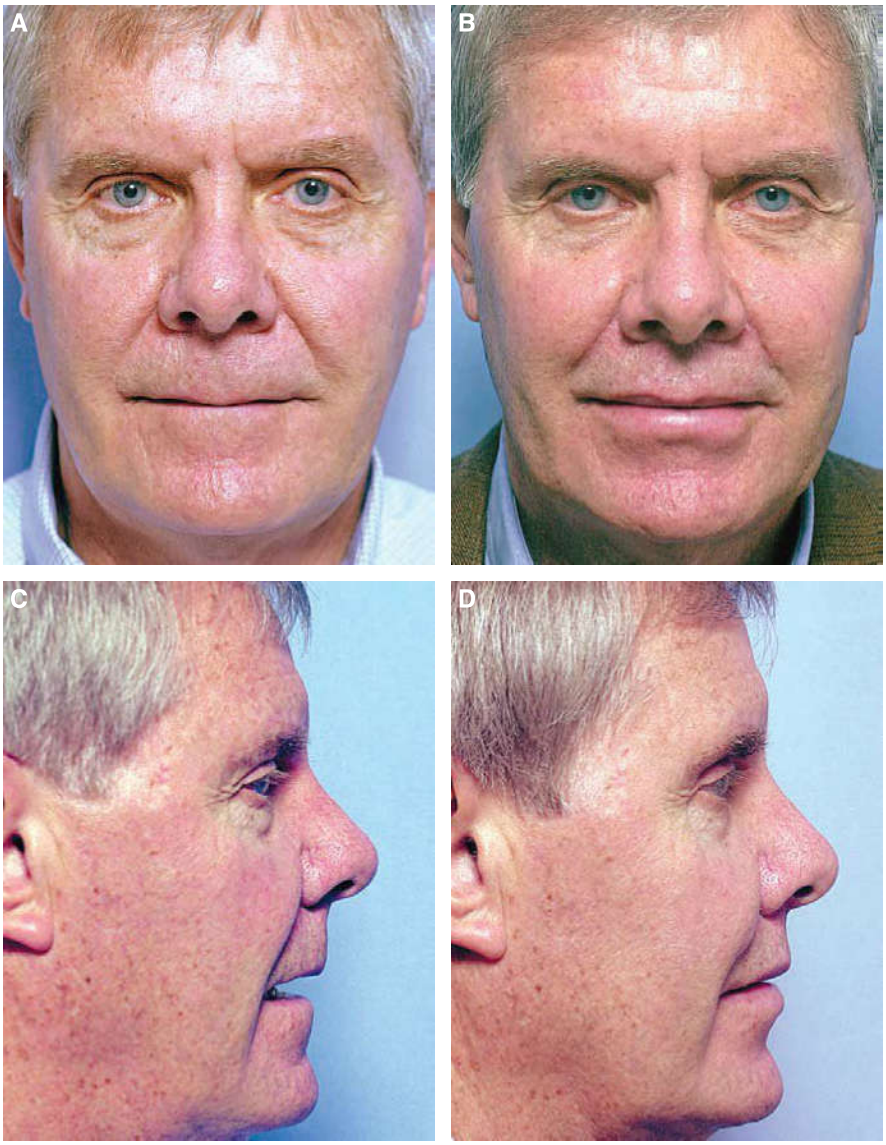
The incision in Fig. 10-45, *D,* will elevate only the central two thirds of the lip. If more fullness is also needed laterally, and the patient already has a nasolabial crease, the incision can be extended into the nasolabial crease, taking out a Burrow's triangle as in Fig. 10-50, *B.*

If more emphasis of cupid's bow is desired, the lower incision is modified as in Fig. 10-50, *B,* widening the strip of skin excised precisely above the cupid's bow peaks. The result can be fairly dramatic (see Fig. 10-50, *C*).

FIG. 10-45, cont'd

The lip lift is only one of the subtle procedures that contributes synergistically to facial rejuvenation. In this case, microfat grafting was done to give more projection and vertical height to the chin. Microfat grafting was also done to the lateral chin notch, tear trough, and malar areas. Minor liposuctioning was performed on the jowls. But the result is more elegant than we might expect (admittedly, complemented by the makeup, hairstyle, and jewelry.) No liposuction was done on the anterior neck; it is simply hidden by the more appropriate increased vertical height of the anterior mandible, created by microfat grafting.

FIG. 10-46



This 69-year-old man had a long upper lip and both lips were extremely thin. He was aware that the combination of long upper lip and extremely thin vermilion (even on side view) was unattractive and made him look edentulous. Even with his mouth open (Fig. 10-46, *C*), his upper teeth could not be seen.

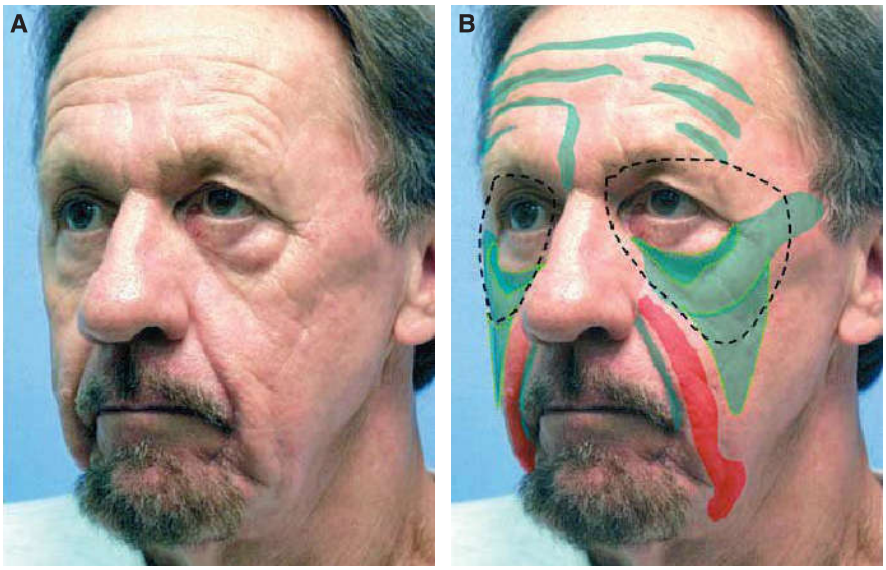
Balance was restored by subnasal lip lift and augmentation by microfat grafting, giving a much more appealing, younger appearance. No other procedures were performed. In the lateral postoperative view, his mouth is open almost to the same degree as in the preoperative photo, but now his fuller lips yield a much more natural profile. We performed an extended (into the nasolabial fold) subnasal lip lift and simultaneous augmentation by microfat grafting. The results look surprisingly more attractive than one might have anticipated.

Rejuvenating Difficult Regions

To develop a surgical plan for patients who request facial rejuvenation, it is best to analyze the face by regions. The following cases were chosen because each one illustrates our approach to one particularly difficult region in the milieu of comprehensive facial rejuvenation.

Forehead

FIG. 10-47



Aesthetic Problems	Surgical Plan
Deep forehead lines caused by chronic frontalis muscle activity to overcome brow ptosis and upper lid redundancy Frown lines	Endobrow lift, microfat grafting (with "pickle fork" V-dissector) to forehead lines and frown lines
Upper lid hooding	Upper blepharoplasty
Scleral show and rounding of lateral lid	Lateral canthal suspension
Lower lid bags	Transconjunctival lower blepharoplasty
Wrinkling of lower lids and malar area	Laser resurfacing periorbital and malar areas
Profound malar soft tissue ptosis and atrophy	Microfat grafting, some areas × 2
Jowling	Liposuction of medial cheeks and jowls
Big nose	Rhinoplasty
Facial and cervical laxity	Face and neck lift

This man's loose jowls and neck are immediately evident, but if we start systematically, from top to bottom, we can identify all the challenges without missing any. He demonstrates (among many other things) one problem not discussed: extraordinarily deep creases caused by excess frontalis muscle activity, which in turn results from blockage of his superior visual field by his upper lids and brow ptosis. This required not only endobrow lift and blepharoplasty, but also "pickle fork" (V-dissector) dissection and microfat grafting to the multiple deep forehead lines.

He also had profound malar hypoplasia and ptosis of the soft tissues. Because of the need for rhinoplasty and a face lift, these were accomplished in two stages, and we took advantage of the second procedure to do supplemental microfat grafting to the areas of greatest soft tissue deficiency.

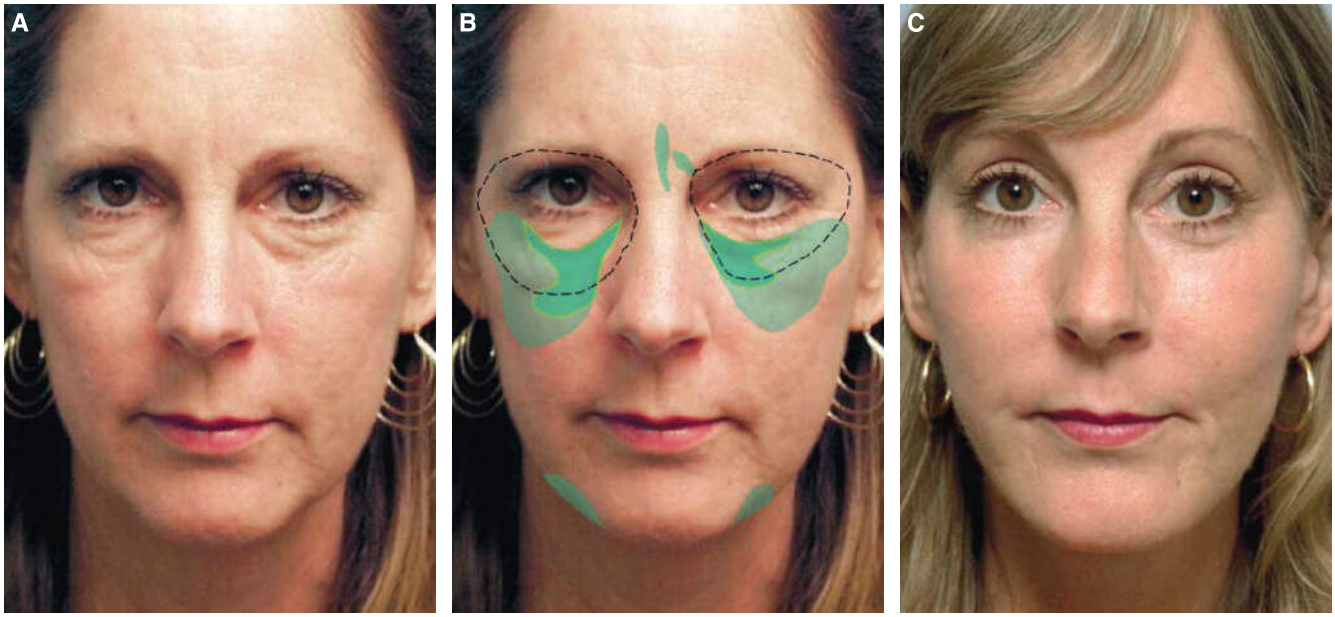
FIG. 10-47, cont'd

The results are shown.

- Deep forehead creases gone
- Brow and lid ptosis improved
- Sunken cheeks now have reasonable projection, except preexisting traumatic scar at midcheek
- Facial and cervical laxity improved
- Improved chin projection and contour permitted patient to shave his goatee

Periorbital Area

FIG. 10-48

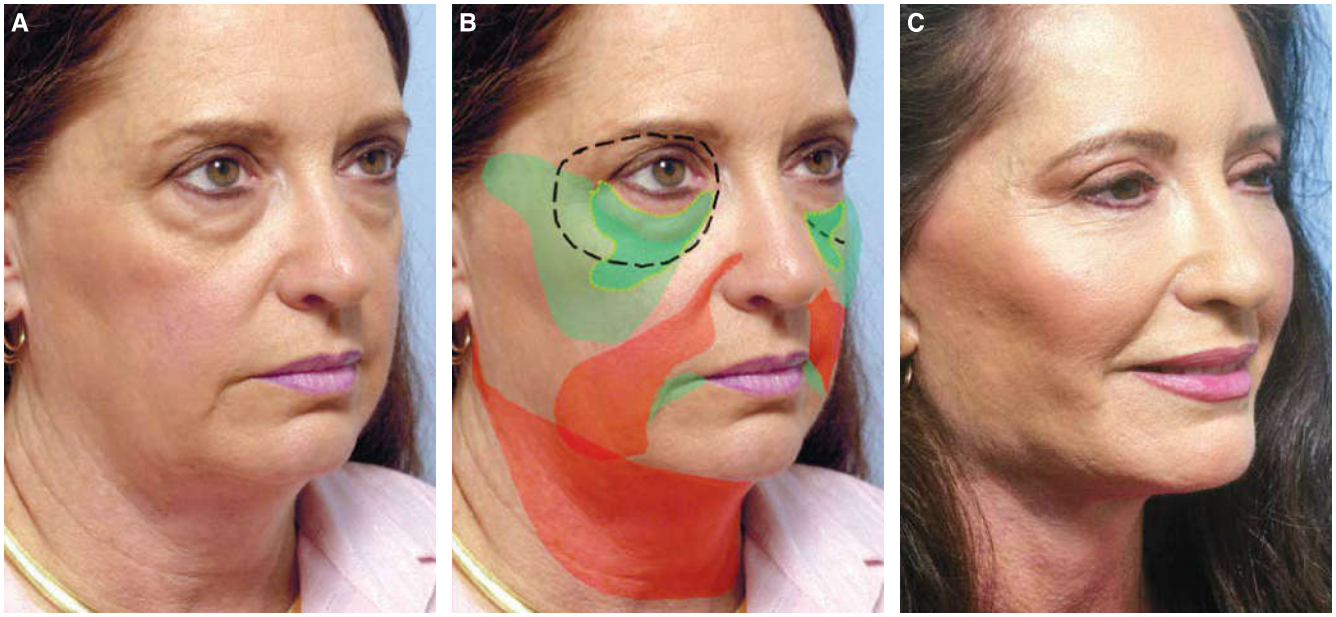


Aesthetic Problems	Surgical Plan
Ptosis of the brows	Endobrow lift
Eyelid bags	Four-lid blepharoplasty
Infrabrow and lid skin is crêpey and heavily wrinkled	Laser resurfacing of periorbital area
Mild glabellar furrows Tear trough Malar hypoplasia Lateral chin notch	Microfat grafting to glabellar furrows, tear trough, and to augment the cheek bones and fill the lateral chin notch
Mild facial laxity	MACS-lift

The aesthetic problems of this 46-year-old woman were mostly in the periorbital area, and made her look tired, or possibly even depressed (which she was not). She required almost every periorbital technique we had: endobrow lift, blepharoplasty, microfat grafting to deep tear troughs and malar-facial grooves, cheek augmentation, and laser resurfacing not only for her wrinkles, but to obliterate her malar bags (festoons). The result is a sparkling, lively, more youthful look. Her looks now match her personality.

Midface/Cheeks/Jawline

FIG. 10-49

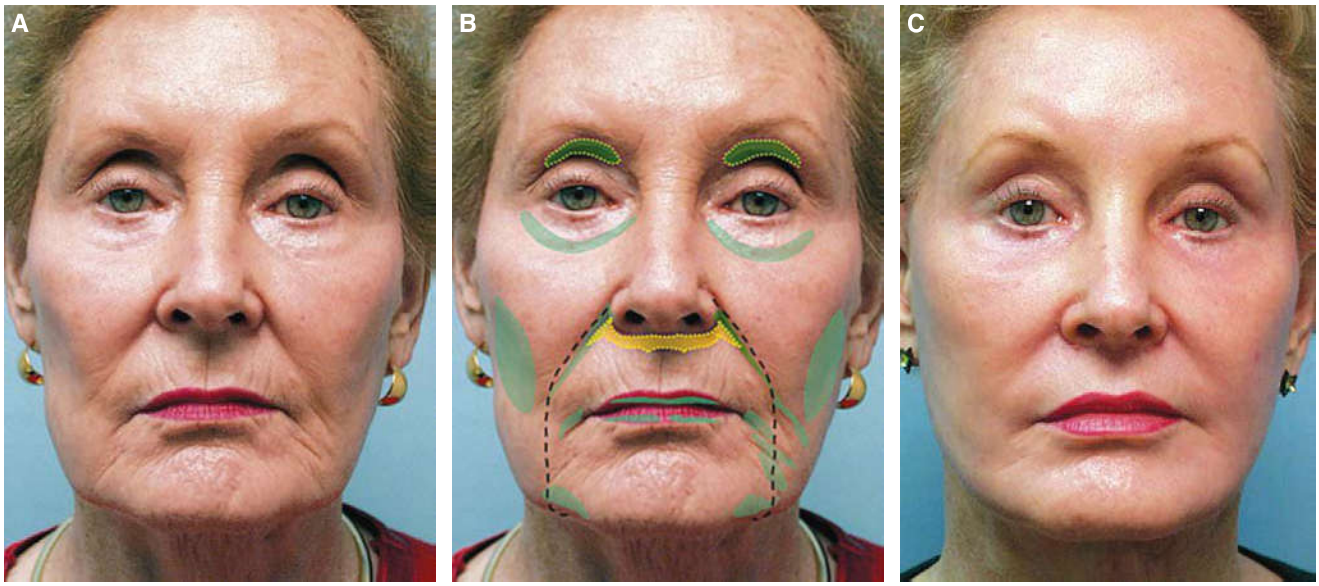


Aesthetic Problems	Surgical Plan
Marked tear trough Very flat cheek bone	Microfat grafting to tear trough and to emphasize cheek bones
Heavy jowls	Liposuction of medial cheeks and jowls
Marionette lines	Microfat grafting to marionette lines
Terrible eyelid bags and wrinkles	Four-lid transconjunctival blepharoplasty Laser resurfacing of periorbital area
Heavy, ptotic brows	Endobrow lift
Heavy neck	Full face lift, liposuction of neck, platysma repair

This 55-year-old woman is an executive who had just received a major job promotion and wanted a fresh, younger look. Her main complaint was, "My eyes and neck obviously need help." There was much ptosis in the cheek, and the jawline was almost totally obscured by jowls and submandibular fat, made worse by microgenia. Her comprehensive plan was implemented in one stage. She is now enjoying life more than ever. She has also just been proposed for another job advancement.

Perioral Area

FIG. 10-50

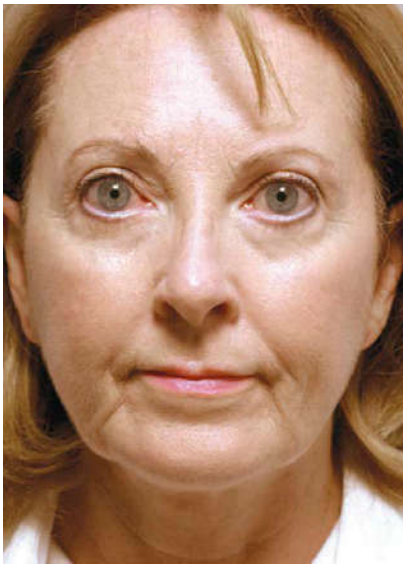


Aesthetic Problems	Surgical Plan
Too gaunt Upper lids are very hollow and sunken Hollowness of midcheeks almost reveals the outline of the skull	Microfat grafting to hollow upper lids, tear trough and hollows of midcheek
Very elderly look to mouth: long upper lip, deep nasolabial folds, extremely deep mouth rugae, thin lips, corners of mouth turn down into marionette lines Notching of mandibular margin at lateral chin	Rejuvenation of mouth area Microfat grafting to nasolabial folds, lines around mouth and lateral chin notches Lip augmentation by microfat grafting Shape of subnasal lip lift *(yellow)* can selectively emphasize cupid's bow peaks and give more vermilion show, in addition to creating a more youthful shorter upper lip
Tear trough	Laser resurfacing
Facial laxity	Face lift

This 69-year-old woman's face looked gaunt and harsh on presentation. She said that her mouth looked like that of an 80-year-old. Her plan included a few special things to deal with the gauntness, including microfat grafting *(green)* to infrabrow/upper lids, tear trough, and midcheeks). Her perioral area was even worse because of various sunken areas around her mouth, extremely deep rugae and wrinkles, thin lips, and a long upper lip. Her plan included an extended lip lift *(yellow)* specially designed to emphasize the cupid's bow, and microfat grafting for extra fullness. The deepest furrows were filled by microfat grafting and careful use of the "pickle fork" V-dissector. The lateral chin notches were filled, and the whole perioral aesthetic unit was smoothed by laser resurfacing. Her entire plan was undertaken in one sitting. The result is a softer, younger look. The softening effect of the microfat grafting to her upper lids/infrabrow is quite interesting.

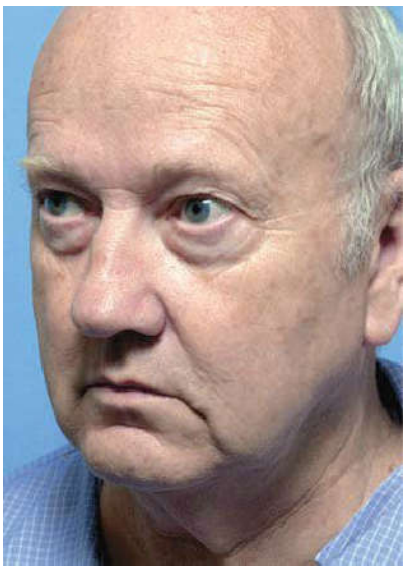
The Exophthalmic Look ("Bug Eyes")

FIG. 10-51



The causes of true exophthalmos are complex, but result in an appearance similar to this woman's for different reasons. In a patient with true exophthalmos caused by hyperthyroidism, the orbit was originally normal. Exophthalmos causes hypertrophy of most of the orbital structures, even the extraocular muscles. The result is too much volume for a normal-sized orbit. Treatment has included orbitotomies, outfracturing or removing the medial, inferior, and/or lateral orbital walls, or even craniofacial surgery in selected cases. This seems like a bit much when there is no risk to vision or other problems associated with exophthalmos and hyperthyroidism.

FIG. 10-52



The appearance of exophthalmos or pseudexophthalmos (bug-eyed appearance) is not rare and can lead to a startling, unpleasant appearance. The cause is primarily malar hypoplasia and shallow orbits.

FIG. 10-53

Aesthetic Problems	Surgical Plan
Bug-eyed appearance of exophthalmos: upper lid retraction, scleral show	Microfat grafting to build out the inferior orbital rim and malar eminence
Hypoplasia of inferior orbital rim	Lateral canthal suspension
Frown lines give the appearance of an angry stare	Microfat grafting to frown lines
Lower lid bags and wrinkles	Blepharoplasty; laser resurfacing of periorbital area
Tear trough; lid-cheek junction is distinct; vertical height of lower lids is too long and asymmetrical	Microfat grafting to tear trough, malar facial groove
Unusually deep and long marionette grooves	Microfat grafting to marionette grooves
Thin lips	Lips augmented by microfat graft
Facial laxity	Face and neck lift

The 57-year-old woman in Fig. 10-51 and Fig. 10-53 had a harsh or critical look on presentation. This patient presented for facial rejuvenation. She posed problems that were previously unsolvable by traditional aesthetic facial procedures. For this patient, a lower blepharoplasty would only make her exophthalmic appearance worse, because by removing fat the shape of the protruding round globe would become more visible.

The most important part of her plan was extensive microfat grafting to build out the deficient inferior orbital rim and malar eminence, which could then conceal the shallow orbits. Equally important was the upward repositioning of her lower lid margin to eliminate the scleral show and staring appearance; we used a lateral canthal suspension to achieve this goal. The excessive fat, which bulged irregularly, was removed by blepharoplasty. Microfat grafting was tapered up to the tarsal plate to give a more natural look.

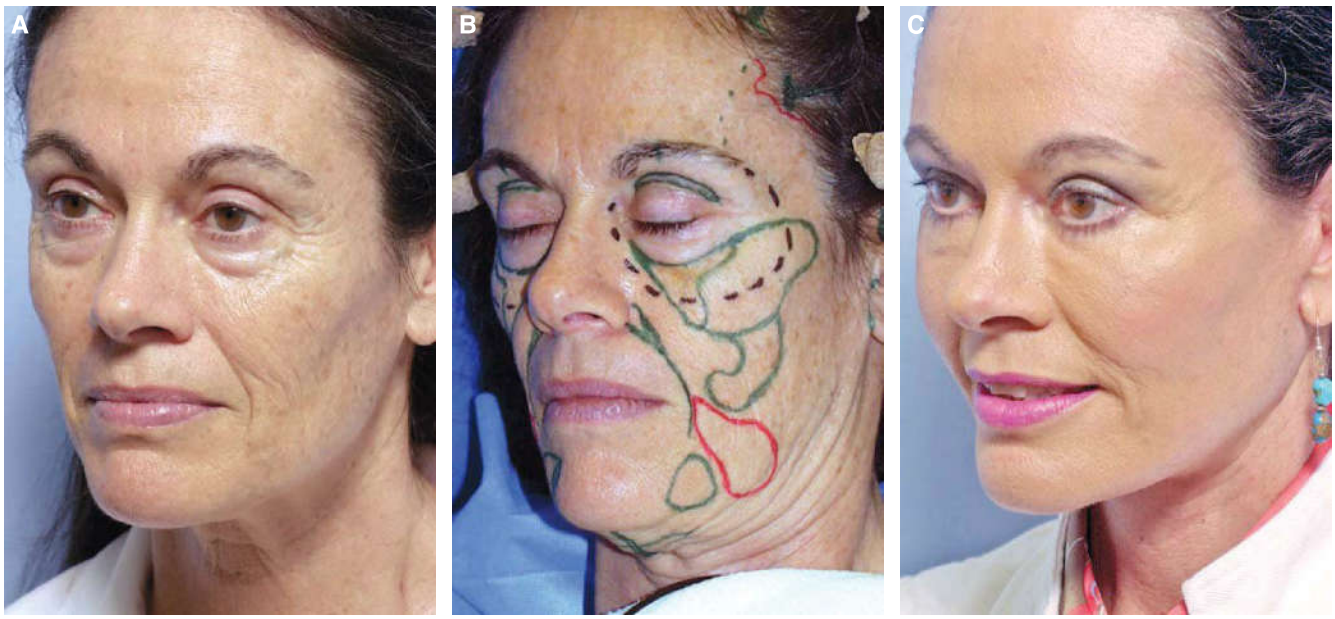
The final periorbital treatment was laser resurfacing to reduce wrinkles and dark circles, and make the lid cheek junction imperceptible. Whenever one area is so unattractive (and so difficult to correct), it is always wise to determine what other procedures could add attractiveness to the face. In this case, a face and neck lift were performed and the peculiar depressions radiating down from her mouth were filled in.

FIG. 10-53, cont'd

The result is a much more pleasant face without a harsh stare or exophthalmic appearance. She has fuller cheeks from the build-out of her inferior orbital rims. The jowls are absent and the jawline is crisp. The postoperative lateral view (Fig. 10-53, *G*), more than 1 year after surgery, shows essentially no loss of the fat grafting and good maintenance of the contour.

Comprehensive Multimodal Facial Rejuvenation

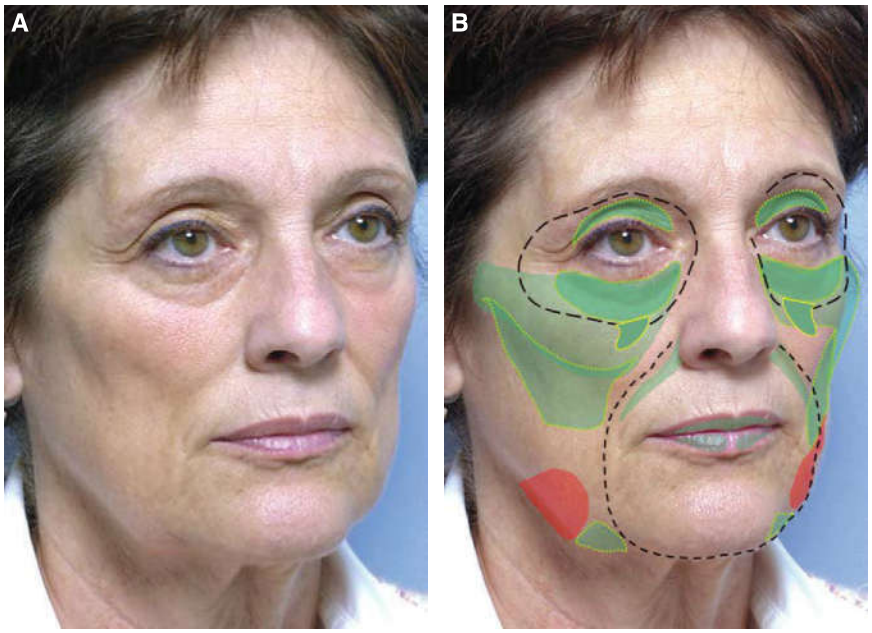
FIG. 10-54



Aesthetic Problems	Surgical Plan
Gaunt look: sunken upper lids, tear trough, hollow midcheeks, deep nasolabial folds, minimal facial subcutaneous tissue	Microfat grafting to sunken lids, tear trough, malar area, hollow of midcheek, nasolabial folds
Lower lid bags and wrinkles, crow's-feet	Laser resurfacing to periorbital area Four-lid transconjunctival blepharoplasty
Facial and cervical laxity with platysma banding	Full face lift with anterior and posterior platysma repair
Splotchy pigmentation	Laser resurfacing of total face

This 57-year-old woman presented with a gaunting pattern as well as all other visual signs of aging, including splotchy pigmentation and solar damage. Her rejuvenation required all the traditional procedures, with an emphasis on microfat grafting to hide the skull-like appearance of her face. The result is a natural look. She looks healthier and perhaps a bit younger.

FIG. 10-55



Aesthetic Problems	Surgical Plan
Ptosis of brows Upper lids sunken (gaunt) Soft tissue of cheek slides down revealing tear trough Atrophy and descent of midcheek fat making cheeks appear gaunt and bony	Minimal endobrow lift Microfat grafting to hollow upper eyelids, lower eyelids, tear trough, malar area, midcheek hollow, nasolabial folds, notches of mandibular margin at lateral chin and lips
Lid-cheek junction is distinct and lower lid is lengthened	Microfat grafting to tear trough and malar facial groove
Eyelid bags	Four-lid transconjunctival blepharoplasty
Lip wrinkles, vermilion thin	Lip augmentation by microfat grafting; laser resurfacing of perioral area
Jowls and rugae	Minimal liposuction of jowls
Loose facial skin Loose neck skin and platysma bands	Full face lift with anterior and posterior platysma repair
Dark pigmentation and wrinkles of the periorbital and perioral areas	Laser resurfacing of periorbital and perioral areas

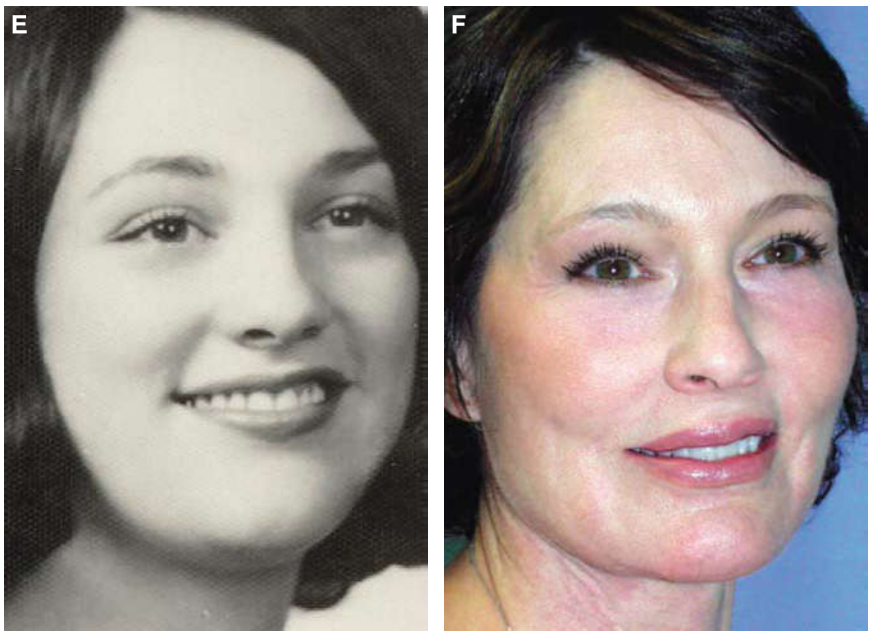
This 59-year-old woman's only daughter was getting married in a year. Her appearance in youth is shown in Fig. 10-3, and her multiple signs of aging and gaunting are identified in Fig. 10-4. Her treatment required almost every tool in our armamentarium.

FIG. 10-55, cont'd

Age 59 (preoperative) Age 60 (postoperative)

The clear, smooth, literally perfect skin draped over her full cheeks and crisp jawline convey a genuine and natural beauty that gives no hints of its surgical origin.

FIG. 10-55, cont'd



Age 20 Age 60

Although this patient does not look 20 again, her facial proportions, fullness, and healthy appearance are much closer to her youthful look than in her age 59 preoperative photo.

To accomplish the most natural, harmonious rejuvenation, especially in difficult cases like these, the surgeon should master not only the "Big Four" (face lift, blepharoplasty, brow lift, and rhinoplasty), but also the five synergistic procedures (microfat grafting, laser resurfacing, judicious facial liposuction, lateral canthal suspension, and subnasal lip lift). When these procedures are applied optimally, they produce true synergy: seven, five, or even three procedures can yield close to a "perfect 10."

BIBLIOGRAPHY

Baylis HI, Long JA, Groth MJ. Transconjunctival lower eyelid blepharoplasty. Technique and complications. Ophthalmology 96:1027-1032, 1989.

Coleman SR. Facial augmentation with structural fat grafting. Clin Plast Surg 33:567-577, 2006.

Coleman SR. Facial recontouring with lipostructure. Clin Plast Surg 24:347-367, 1997.

Coleman SR. Long-term survival of fat transplants: Controlled demonstrations. Aesthetic Plast Surg 19:421-425, 1995.

Coleman SR. Structural Fat Grafting. St Louis: Quality Medical Publishing, 2004, pp 295-297.

Coleman SR. Structural fat grafting: More than a permanent filler. Plast Reconstr Surg 188(3 Suppl):S108-S120, 2006.

Coleman SR. Structural fat grafts: The ideal filler? Clin Plast Surg 28:111-119, 2001.

Fagien S. Advanced rejuvenative upper blepharoplasty: Enhancing aesthetics of the upper periorbita. Plast Reconstr Surg 110:278-291, 2002.

Fitzpatrick RE, Goldman MP, Satur NM, et al. Pulsed carbon dioxide laser resurfacing of photo-aged facial skin. Arch Dermatol 132:395-402, 1996.

Glat PM, Jelks GW, Jelks EB, et al. Evolution of the lateral canthoplasty: Techniques and indications. Plast Reconstr Surg 100:1396-1405, 1997.

Hester TR, Codner MA, Clinton DM, Nahai F, et al. A. Evolution of technique of the direct transblepharoplasty approach for the correction of lower lid and midfacial aging: Maximizing results and minimizing complications in a 5-year experience. Plast Reconstr Surg 105:393-406, 1999.

Jacobson A. Radiographic Cephalometry: From Basics to Videoimaging. Chicago, IL: Quintessence Publishing, 1995, pp 117-119.

Jelks GW, Glat PM, Jelks EB, et al. The inferior retinacular lateral canthoplasty: A new technique. Plast Reconstr Surg 100:1262-1270, 1997.

Lambros V. Fat injection for the aging midface. Oper Tech Plast Surg 5:2, 1988.

Little JW. Three-dimensional rejuvenation of the midface: Volumetric resculpture by malar imbrication. Plast Reconstr Surg 105:267-285, 2000,

Mendelson BC, Muzaffar AR, Adams WP Jr. Surgical anatomy of the midcheek and malar mounds. Plast Reconstr Surg 110:885-896, 2002.

Pessa JE, Desvigne LD, Lambros VS, et al. Changes in ocular globe-to-orbital rim position with age: Implications for aesthetic blepharoplasty of the lower eyelids. Aesthetic Plast Surg 1999 23:337-342, 1999.

Roberts TL. The ultrapulsed CO_2 laser: An important new tool in the aesthetic plastic surgeon's armamentarium. Presented at the Annual Meeting of the American Society for Aesthetic Plastic Surgery, San Francisco, March 1995.

Roberts TL, Ellis LB. In pursuit of optimal rejuvenation of the forehead: Endoscopic brow lift with simultaneous carbon dioxide laser resurfacing. Plast Reconstr Surg 101:1075-1084, 1996.

Roberts TL, Weinfeld AB, Bruner TW, et al. "Universal" and ethnic ideals of beautiful buttocks are best obtained by autologous micro fat grafting and liposuction. Clin Plast Surg 33:371-394, 2006.

Tonnard P, Verpaele A, Monstrey S, et al. Minimal access cranial suspension lift: A modified S-lift. Plast Reconstr Surg 109:2074-2086, 2002.

Tonnard PL, Verpaele AM. The MACS-Lift: Short-Scar Rhytidectomy. St Louis: Quality Medical Publishing, 2004.

Zide BM, Jelks GW, eds. Surgical Anatomy of the Orbit. New York: Raven Press, 1985, pp 21-65.

Index